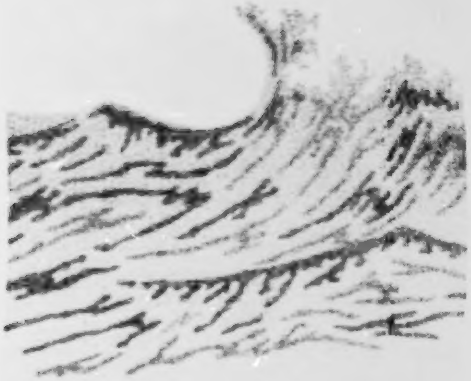
FISHERIES
RESOURCE
CONSERVATION
COUNCIL

"FISHERIES IN TRANSITION"

ANNUAL REPORT OF THE FISHERIES RESOURCE CONSERVATION COUNCIL AND CONSERVATION REQUIREMENTS FOR ATLANTIC GROUNDFISH STOCKS FOR 1999



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LETTER TO THE MINISTER

101-02076/

Honourable David Anderson
Minister of Fisheries and Oceans
200 Kent St.
Ottawa, Ontario
K1A 0E6

Dear Minister Anderson:

I have the honour to present to you the annual report of the Fisheries Resource Conservation Council (FRCC) for 1998. This report provides a summary of the work the Council has undertaken over the past year including our conservation requirements for Atlantic and Eastern Arctic groundfish stocks for 1999.

We have titled our report *Fisheries in Transition*, as that is what we see the 1999 fishing year to be. After seven years or so of closures in many stocks, we are clearly seeing the light at the end of the tunnel, albeit a dim light in some cases. In previous years the Council has basically been practicing 'risk avoidance' but we have now changed our focus to be more along the lines of 'risk management'. We are beginning to see clear signs of recovery in many stocks but we have made it very clear in our reports to you that the attitudes and fishing practices of the past must change if we are to maintain our forward momentum and realize that the resources of the oceans are not unlimited. The recovery in some stocks is still at the stage where one season of irresponsible fishing could easily take the stock back to near collapse again. In other words, we must accept the code of responsible fishing, conservation must still be our number one priority and in this regard, the recommendations put forward in our July 1997 report to you entitled *A Groundfish Conservation Framework for Atlantic Canada* in July (FRCC.97.R.3) must continue to form the cornerstone for the management of our groundfish fisheries.

We thank you for the opportunity you have provided us to make a contribution to the betterment of the Atlantic groundfish fishery.

Fred Woodman
Chairman

CHAPTER 1: CHAIRMAN'S REPORT

The Fisheries Resource Conservation Council (FRCC) was created in 1993 to provide a more effective role in decision making for those with practical experience and knowledge of the fishery. It was established to be a partnership between governments, the scientific community and the direct stakeholders in the fishery. Its mandate is to contribute to the management of the Atlantic fishery on a sustainable basis.

The Council has three standing committees: the Stock Assessment Committee; the Environment and Ecology Committee and the Management and Regulations Committee. In 1998, the Council's activity on these committees was curtailed to some degree largely due to several vacancies that were not filled on a timely basis. This made it difficult to carry on the work of these Committees. By the end of the year, however, the Council had six new members. Two of the Committees have new Chairmen both of whom are new members. There were also numerous changes to staff positions in the Secretariat.

The Stock Assessment Committee has made its priority in the past year to work on the Precautionary Approach. A preliminary document embracing this philosophy has been drafted and reviewed by a committee of industry representing several regions of Atlantic Canada, managers and scientists from DFO and members of the FRCC. It was agreed in principle to conduct a pilot project that would take a hands on practical approach to the implementation of the concept. This pilot project is scheduled to occur in the fall of 1999 with full participation of DFO Science, management and industry.We believe this will be a valuable learning experience and will prepare us for the implementation of this approach in other stocks.

This is the second time the Council has issued an annual report. Prior to the 1998 fishing year, our advice on groundfish conservation requirements to the Minister was done in one large report and we used that opportunity to relay some general concerns and themes. For 1998 and again for 1999 we produced a series of reports on groundfish conservation advice which we released throughout the autumn, winter and spring months. This allowed the Council to better match the latest advice from DFO Science, industry consultations and the results of the sentinel fisheries with the timing of the Council's advice. This was especially important for most cod stocks as DFO Science, again, held a special zonal assessment meeting in March 1999 to discuss the latest information on those stocks. Given the smaller and more regionally based reports the Council now produces, we believe it necessary to offer a more comprehensive package of the Council's work each year.

The title of this year's annual report, *Fisheries in Transition*, conveys our belief that there really is improvement in many groundfish stocks. After many years of moratoria and greatly reduced TACs, we are beginning to see definite signs of an upward swing in the health of many stocks, although not in all of them. In the past, the Council practiced what is now commonly referred to as 'risk avoidance' - given the precarious state of many stocks, fishing was to be kept to a minimum in order to assist in recovery. However, one of the problems with this tack was that we were not getting enough information on the stock - other than research surveys, there was nobody on the water fishing and collecting information vital to the scientists in their assessments. A few years ago, the Council recommended that a 'Sentinel Fisheries Program' be established, which has now been in place for a few years and has greatly added data to the assessment process. Last year, the Council recommended that 'Index Fisheries" be established in certain cod stocks to, again, assist in collecting vital information. While we still believe our rationale for such a program was sound, it was perceived as a mini-directed commercial fishery with all the accompanying debate over fleet shares and access and was, therefore, not particularly successful in the way the Council had envisaged. Therefore, for 1999 and beyond we chosen not to recommend such a program and have opted instead, where warranted, to recommend limited commercial fisheries.

COUNCIL REPORTS FOR 1999 FISHERIES

The Council has published five separate reports containing recommendations to the Minister for 1999:

October 1998 *1999 Conservation Requirements for Groundfish Stocks other than Cod in Sub-Area 0 and Area 2+3;*

November 1998	*1999 Conservation Requirements for Scotian Shelf and Bay of Fundy Stocks, Redfish Stocks, Unit 1-3 and 3O and Groundfish Stocks in Division 3Ps;*
April 1999	*1999 Conservation Requirements for the Gulf of St. Lawrence Groundfish Stocks and Cod Stocks in Divisions 2GH and 3Ps;*
May 1999	*1999 Conservation Requirements for Georges Bank Groundfish Stocks; and,*
May 1999	*1999 Conservation Requirements for 2J3KL Cod.*

CONSULTATIONS WITH STAKEHOLDERS

The Council held extensive consultations with stakeholders before deciding on its recommendations for each of these reports. In total, well over 2,000 attended consultations in sixteen locations and a total of 76 written briefs were submitted to the Council for consideration.

There was one main theme that came across very clearly in almost all of the Council's consultations for the 1999 fishery - a disagreement with DFO Science on the state of many groundfish stocks. In a great many cases, fishers believe that stocks are in much better shape than described in the Stock Status Reports. The divergence of views between scientists and fishers is nothing new and is found in most stocks. This is one of the challenges facing the Council each year as it discusses its recommendations. However, in at least one instance this year (Southern Gulf cod) the Council was concerned that the divergence of views was particularly wide. In cases such as this it is becoming increasingly difficult for the Council to 'pick and choose' between the scientific evidence and the evidence provided by fishers. In the end, however, conservation and sustainability must come first.

The end of income support programs, such as TAGS, is putting tremendous pressure on everyone to find enough fish to keep everyone working. The Council has long advocated that there is excess capacity in the groundfish sector and although there have been a number of programs in place aimed at reducing the capacity, such reductions have been minimal to the overall capacity.As the Council mentioned in one of its recent reports, this is unfortunate as with increasingly good signs in many stocks, there is increasing anticipation by fishers that things will soon be back to normal. **This is not the case.**

Fishers are frustrated. Science is frustrated. Since the first moratorium was put in place in 1992, a number of commercially important groundfish stocks have been closed for as much as seven years. The most devastating of these have been the cod stocks, a species that has been the mainstay of the groundfish industry in Atlantic Canada for generations. Stakeholders had thought that with so many years of closures and so much time to undertake the necessary research, that we would have a better idea of the state of these stocks by now. Unfortunately this is not the case. The Council clearly shares the disappointment in this turn of events.

THE NEED FOR BETTER SCIENCE

There is no question that DFO scientists and fishers are working together much better now than when the moratoria first began. There are numerous cooperative DFO Science/industry surveys and programs underway, the most notable of which is the Sentinel Fisheries Program. We must continue to promote Science-Industry co-operative projects.

However, the reduction in funds available to DFO Science to carry out even its basic functions has been of particular concern to both industry and the Council. In its March 24, 1999 letter to the Minister on Science Priorities, the Council paid particular attention to this erosion of funds and pointed out some of the areas that we believe need to be addressed. The Council believes that the continuing financial constraints placed on fisheries science are manifesting themselves in an environment that is not conducive to collegial collaboration required for good science. Sufficient funds must be made available to permit the process to work effectively.

One of these issues which needs to be emphasized is the need to identify and verify the existing stock management units. There is growing evidence of stock mixing in some areas that is troublesome to the Council. Fishers operating in one area at a particular time of year could be catching fish from another stock area, thereby having a direct influence on the health of the neighbouring stock. This is a notable problem for cod stocks around Newfoundland and for Redfish stocks in Units 1 & 2. The Council has strongly recommended that a major tagging program be put in place to assist in gathering more information about these phenomena. The shift of cod in the Bays and near shore areas needs immediate study and abundance quantified.

The recruitment dilemma has also been addressed in our science priorities letter. Sharing of information among regions does not appear to take place and it is our believe that, because of this, warning signs of stock collapse are being missed.

SEALS

As in previous years, the expanding seal population issue was raised at all consultations as a frustrating impediment to the recovery of groundfish. The accumulated evidence from scientific assessments, as well as the consistent, continual, and corroborating information from fishers throughout Atlantic Canada is such that the FRCC is convinced beyond any reasonable doubt that the recovery of groundfish stocks, notably cod, will continue to be jeopardized if the seal herds remain at their current levels. It should also be noted that the present populations of seals, especially harps, are at or near their carrying capacity.Among its recommendations for ways of dealing with this issue, the Council advocates reducing the seal population by up to 50% in specific areas and using such reductions as a basis for scientific study and adaptive management.

The Council's recent recommendations on seals received considerable attention, as they were the most specific recommendations we had made on this issue to date. In applying the precautionary approach to groundfish management, we pointed out that action must be taken immediately in order to improve opportunities for the conservation and recovery of cod and other groundfish stocks, without waiting for absolute scientific proof of the effects of seal predation.

CONSISTENCY IN CONSERVATION MEASURES

The Council may also advise the Minister on the position taken by Canada with respect to straddling and transboundary stocks under NAFO jurisdiction. The Council is pleased to note by Stock Status Report that yellowtail flounder and Greenland halibut are showing excellent signs of improvement. Unfortunately, many of the other stocks which are important to Canadian industry are not showing the same signs of improvement, namely 3NO cod, American plaice and witch flounder.We are concerned about the significant by-catch levels outside 200 miles and about the targeting of juveniles in the Greenland turbot fishery.The exploitation of unregulated species e.g., skate and grenadier is also a serious concern. In addition, there are multi-species ramifications for groundfish resources in the area that are severely depressed. For example, it is believed that the higher increase of catches of American plaice in Divisions 3LNO is largely attributable to the increased effort to catch skate in the NAFO regulatory area. In our letter to the Minister last year on NAFO stocks, we requested that the Scientific Council should recommend sustainable levels of harvest for the species.

Finally, conservation measures adopted by the NAFO Fisheries Commission should be consistent with those that apply in the Canadian waters. For example, the use of conservation harvesting plans, small fish protocols, mandatory dockside monitoring and closure during peak spawning periods are common features of Canada's domestic fishery and could greatly improve the NAFO conservation regime. There must be consistency in conservation measures, Canadian harvesters must not bear the burden alone.

CHAPTER 2:
GROUNDFISH STOCKS IN SUB-AREAS 0,2+3 (EXCEPT 3PS AND COD)

Introduction

This report is one of a series that the Fisheries Resource Conservation Council (FRCC) makes to the Minister of Fisheries and Oceans on conservation measures for groundfish stocks in eastern Canada. This report deals with groundfish stocks other than cod in Sub Area 0 and Area 2+3 (except 3Ps) and makes recommendations for the 1999 fishery.

Every year the Fisheries Resource Conservation Council (FRCC) holds a series of public consultations with stakeholders to gather information on all Atlantic groundfish stocks. This information assists us in forming our recommendations to the Minister of Fisheries and Oceans for annual conservation requirements. For this report we met with fishers and other concerned stakeholders in Grand Falls, Newfoundland on October 7 and in Clarenville, Newfoundland on October 8. We also received a number of written briefs which are noted in appendix 3.

Although this report deals with groundfish stocks in Sub area 0 and Area 2+3, it does not include recommendations for cod stocks in divisions 2GH, 2J3KL and 3Ps or any other stocks in 3Ps. Recommendations for those stocks will be included as part of two separate FRCC reports to the Minister.

Special Zonal Assessment for cod

For this year again, the Department of Fisheries and Oceans (DFO) Science will be holding a special zonal assessment for the following cod stocks: 2J3KL, 3Ps, 4RS,3Pn and 4TVn. This special assessment is currently scheduled for March 1999 in order to incorporate all available information into the assessment, including all recent surveys and the results of the sentinel and Index fisheries. Until this special zonal assessment is held the FRCC will not be receiving advice from DFO Science on these cod stocks. It is important for everyone to have the results of the latest assessment before we consult on these stocks.

As a result of this change and changes in scheduling of assessments for other groundfish stocks, the FRCC's consultations will be staggered throughout the autumn and into the new year. Our schedule for future consultations includes the following:

November 16-20: 3Ps (except cod), Scotian Shelf / Bay of Fundy , Redfish-Units 1,2,3 and 30
April/99: Gulf Groundfish Stocks
April/99: Cod Stocks (2J3KL, 3Ps, 4RS,3Pn and 4TVn)

Conservation Issues

During our consultations many concerns were raised about the state and health of groundfish stocks and most of these concerns are dealt with in Chapter 2 of this report in Stock-by-Stock recommendations. However, the Council wishes to high-light some of these concerns and draw particular attention to certain problems.

Greenland Halibut 0B + 1B-F

As part of our previous recommendations on this stock, *Building the Bridge (October 1996)*, we recommended that "the emerging fishery by gillnets in deep water be carefully monitored as it appears to have serious problems." We noted again in our *Report on Gear Technology in Eastern Canada (March 1997)* that many concerns had been expressed by fishers and other stakeholders about the practices associated with this gear type in the deep water turbot fishery. We recommended as part of that report that "...protocols should be established that limit the amount of gear permitted to that which can be handled in a reasonable time period for the vessel size and area, and that restrict the length of soak time. In areas where there is potential for gear loss, and hence for ghost fishing, this shall be taken into account in developing the protocols on gear amounts, and additional requirements on gear specifications incorporated. Consideration should be given to requiring tagging of nets to facilitate quantification and identification of lost gear."

During our consultations for the 1998 season, the problems associated with the excessive use of gillnets at extreme depths were raised more strongly than ever. Fishers expressed grave concerns about the effects of this fishery on the Greenland halibut stocks, especially as it relates to ghost fishing by lost nets, unaccounted mortality as a result of float-outs while the net is being hauled, and discards as a result of deteriorating quality brought on by extended soak times. Participants at consultations also expressed concern with respect to the ghost fishing of gillnets and marine mammals such as narwhal, bowhead and beluga whales which dive to depths of up to 600 fathoms and can become entangled in gillnets.

In our recommendations for 1998 we noted our belief that it was necessary to determine the extent to which these problems existed and as part of our recommendation for this stock we recommended that at-sea observers be deployed in this fishery to gather specific data on some of the issues addressed by stakeholders.

The Council was glad to see that, for the 1998 fishery, DFO implemented its recommendations regarding the management of the gillnet fishery. While preliminary data from the limited observer coverage seems to indicate that many of the previous concerns are no longer valid, the Council is still concerned with soak time of gillnets and subsequent quality of the catch which could lead to discarding. The Council's recommendations in Chapter two therefore call for a continuation of observer coverage to gain further data on this fishery.

If the concerns which were raised repeatedly at previous consultations are proven to be well founded then there will have to be changes made to the way in which this fishery is conducted. As we recommended in the *Groundfish Conservation Framework for Atlantic Canada (July 1997)*, "...if detrimental effects [of this gear] cannot be mitigated, the technology in question should be banned." While there were no specific comments made during the Council's most recent consultations, fishers at our consultations for the 1998 fishery made the point that there must be a better way to fish and if changes to this fishery are not forthcoming, a possible change in the type of gear employed may have to be recommended.

The Council also shares the views of a number of stakeholders that DFO Science should carry out more scientific work in this area. It was noted that Canada has not carried out any survey work here since 1986 and in recent years this fishery has become a very important stock for a number of fleets, and in particular northern interests.

2+3KLMNO GREENLAND HALIBUT

The Council continues to be concerned with the long-term health of this stock. It is a stock that is fished both within and outside Canada's 200-mile limit and, as such, Canada does not have complete control over the management of this fishery. The NAFO Scientific Council has noted that the fishable stock should continue to increase but it was unable to advise on a specific TAC for 1999. However, it noted that an increase of catch from the 1996-97 levels (20,000t) to 30,000t should not impede recovery. It also recommended that measures be considered to reduce, as much as possible, the exploitation of juveniles and the by-catch of 2+3K American plaice.

While the FRCC is encouraged by the signs of good recruitment it was saddened to see that the NAFO Fisheries Commission, at its September 1998 meeting, set the 1999 TAC at 33,000t but made no changes to the existing NAFO Measures to improve conservation. Improvements in conservation measures must be adopted to allow the incoming good year-classes to grow and contribute to the spawning biomass. Juveniles must receive adequate protection and Canada must lead the way. Selectivity work must be undertaken to provide the necessary data to persuade NAFO to increase the existing mesh size from 130 mm to a more appropriate level.

2J3KL WITCH FLOUNDER AND 2 + 3K AMERICAN PLAICE

The Council continues to be concerned about the prospects for the rebuilding of these stocks. Council is particularly concerned that these species are being captured as by-catch in the Greenland halibut fishery outside of the Canadian zone where 130 mm diamond mesh is used. The Council wishes to re-iterate its concern expressed last year that any amount of by-catch, especially that of juvenile fish, can diminish the chances of recovery for these stocks. Canada should continue to be vigilant in its efforts to keep by-catches to an absolute minimum and to continue to push NAFO to increase the minimum mesh size in the Greenland halibut fishery to a more appropriate level.

BY-CATCH LIMITS

For a number of stocks for which the Council continues to recommend a moratorium on fishing we have, again, recommended that by-catch protocols be applied. This is somewhat different than our recommendations in years previous to 1998 when we had recommended that by-catches be limited to a specific number or otherwise be kept to the lowest possible level. We originally made this change for the 1998 season in light of the obvious difficulty in trying to determine what is an appropriate level of by-catch that will minimize risks for the stocks which are still under moratoria while allowing for continued commercial fishing on other species which are not under moratoria.

We continue to believe that allowing DFO, in conjunction with the industry, to determine the appropriate by-catch levels will achieve a compromise that prevents directed fishing or excessive by-catches on species under moratoria while allowing commercial fisheries to continue. This change in wording should not be interpreted as a relaxing of the FRCC's position that by-catches should be kept to the lowest reasonable level.

During our most recent consultations, a number of stakeholders expressed concern that the by-catch levels outlined in DFO's Small Fish and By-catch Protocol were perhaps being unduly restrictive in some cases and an across-the-board by-catch level may not be the most appropriate way to manage some fisheries. The Council shares these concerns and, as a result, has undertaken a review of by-catch measures. We hope to have suggestions on how to better handle the by-catch issue in our next report.

ENVIRONMENTAL OVERVIEW

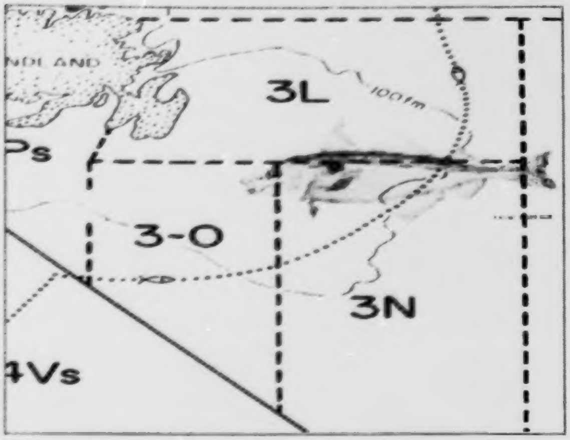
Annual air temperatures over most of the northwest Atlantic were cooler in 1997 compared to 1996. They were however, warmer than normal over the Labrador Sea. Sea ice generally arrived later and left early resulting in a shorter duration than usual, although the extent was greater than in 1996. The number of icebergs reaching the Grand Banks was higher than in 1996 but still about 60% lower than during the early 1990s.

At Station #27 off St. John's, temperatures over all depths were near normal or above normal throughout the water column during winter months. In April the surface waters became cooler than normal and this cooler water extended into May. It gradually extended deeper to reach 100 meters by October. During fall, temperatures in the upper layers were near normal, while bottom temperatures were near normal throughout the year.

Summer salinity values continue to be below the long term average. During the summer of 1997, the area of the cold intermediate layer (CIL) on the Newfoundland shelf was below normal, continuing the declining trend from 1995. Core temperatures were near normal within the CIL.

Off the south coast, the relatively cold conditions which began around the mid-1980s have moderated somewhat, even though below normal bottom temperatures continued through 1996. There was some cooling again in 1997 although temperatures warmed to near normal late in the year in inshore areas.

HADDOCK - 3LNO



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council noted that the TAC had been reduced to 500t for 1993, from 4,100t in 1992, following recommendations from scientists that removals be limited to a by-catch fishery with a precautionary ceiling of no more than 500t. In order to prevent a repeat of the heavy exploitation that was exerted in the mid-1980s on the 1980 and 1981 year-classes, the Council recommended that there be no directed fishing for the 3LNO haddock stock in 1994 and that by-catches be limited to 500t. In November 1994, the Council reiterated its advice for no directed fishery and recommended reducing the by-catch limit to 100t for 1995. The Council noted in 1995 that there had been no signs of improved recruitment and there were no prospects for stock improvement in the near future. It again recommended no directed fishing in either 1996 or 1997 and a by-catch limit of 100t each year.

For 1998, the Council recommended continuation of the prohibition on directed fishing and that by-catch protocols be applied when prosecuting other fisheries.

1998 CONSULTATIONS:

At the consultation in Clarenville, it was noted haddock was once a major fishery and concern was voiced that conservation of this species, with the goal of restraining the stocks to something approaching previous levels, should not be sacrificed in favour of other species occurring in the same area.

ANALYSIS:

The 1996 DFO Stock Status Report and the 1998 Newfoundland Region Groundfish Overview indicate that:

- high catches in the 1980s were due to the strong 1980 and 1981 year classes.
- there is no evidence of more recent strong year-classes.
- this stock will not begin to recover unless there is good recruitment.

Haddock abundance in 3LNO was low throughout the 1979s, higher in 1984-1988, and subsequently low.Very few haddock have been found in recent research vessel surveys. The research surveys show that recent year classes are weak and there are no prospects of the stock improving in the near future. Fish that reach spawning age must be protected if recruitment is to improve in the future for this stock.

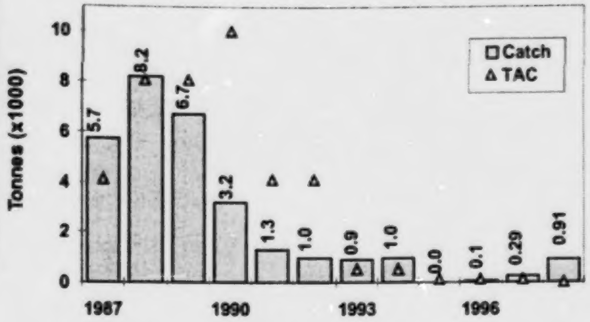
Preliminary information from the 1998 0-group survey (which was not available for inclusion in the Groundfish Overview Report) suggests the possibil-

RECOMMENDATIONS:

The FRCC recommends that:

1 there be no directed fishing for 3LNO haddock in 1999 and by-catch protocols be applied when prosecuting other fisheries; and,

2 DFO Science undertake the necessary work immediately to determine if any areas in 3LNO could be considered as nursery areas for haddock.



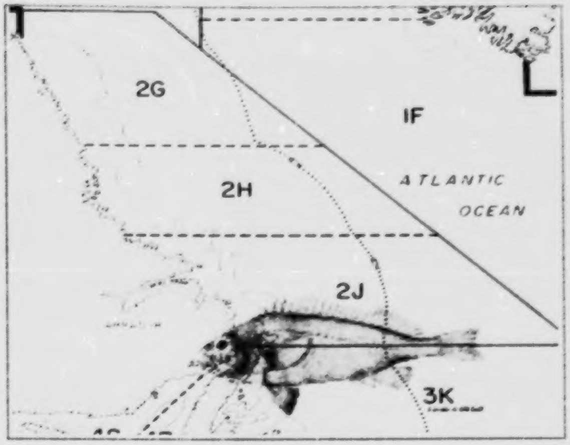
* 1998 Catch: as of Dec.2/98

ity of a good 1998 year-class. Given that this used to be a major fishery up until the 1960s, the Council believes that measures must be adopted to protect this year class. It is believed that the current NAFO moratorium on various stocks in this area will assist in the protection of this year-class. However, the Council strongly believes that work should be undertaken to determine whether there is any particular area that could be considered as a nursery area.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall stock Indicator:	low
	Compared to average
Spawning biomass:	low
Total Biomass:	low
Recruitment:	production of young haddock has been poor since 1980-81 but preliminary indications from the 1998 survey suggest a possible improvement
Growth and Condition:	not available
Age Structure:	all recent year classes weak
Distribution:	few in 3L
Recent Exploitation Level:	unknown; fishing pressure likely reduced due to moratoria on cod and flatfish, and to reduced by-catch limits

REDFISH - 2+3K



HISTORY OF FRCC RECOMMENDATIONS:

In 1993, the Council observed that, given the very low level of this stock, the TAC of 20,000t was too high and recommended, as a precautionary measure, that the 1994 TAC for the 2+3K redfish stock be set at 1,000t. There was practically no fishing during 1994. In November 1994, the Council recommended that any directed fishery, should it be allowed, be carried out within the framework of a scientifically coordinated test fishery and that a nominal amount of 200t be provided for that purpose in 1995. This advice was repeated for 1996.

In October 1996, the Council recommended that there be no directed fishing in 1997 on 2+3K redfish. The same recommendation was made for 1998 with the additional recommendation that by catch protocols be applied when prosecuting other fisheries.

1998 CONSULTATIONS:

The only specific comment received on this stock during the 1998 consultations was that although there has not been any directed fishery for this stock for some time, this may be due to the presence of parasites making the fishing undesirable.

ANALYSIS:

The 1996 DFO Stock Status Report and the 1998 Newfoundland Region Groundfish Overview indicate that:

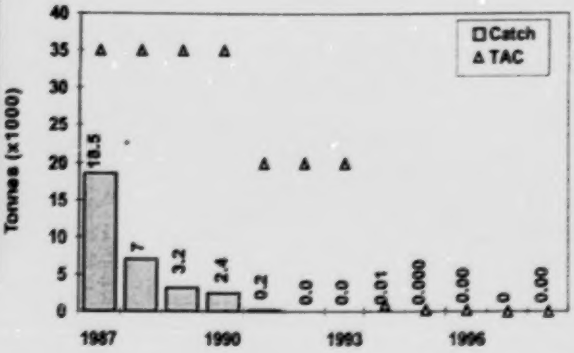
- there has been virtually no recruitment since early 1970s.
- this stock remains at a very low level.
- there are no indications that the status of the stock will change in a positive way in the foreseeable future.

The survey biomass indices fell to extremely low levels in 1994; declines were of the magnitude of about 95-99%. The most recent survey produced somewhat higher catches of small fish but cannot be directly related to historical estimates because of a change in the survey vessel and gear. These index estimates are still low compared to estimates from the mid-1980s. There are no indications of good recruitment. Recruitment into this stock, when it occurs, would require a minimum of 10 years before if would contribute to any fishery. No fishing on this stock is justified.

RECOMMENDATIONS:

The FRCC recommends that:

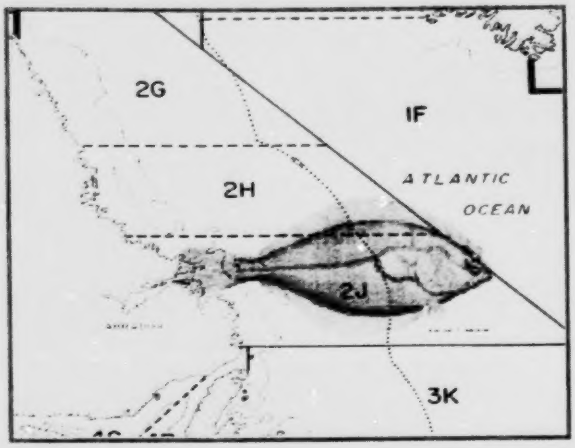
1. there be no directed fishing in 1999 on 2+3K redfish and that by-catch protocols be applied when prosecuting other fisheries; and,
2. DFO Science investigate why significant recruitment to this stock has not been observed over the last several decades.



COUNCIL'S VIEWS ON STOCK STATUS:

Overall stock Indicator:	extremely low *Compared to average*
Spawning biomass:	very low
Total Biomass:	very low; less than 10% of 1978-88 average
Recruitment:	very poor
Growth and Condition:	not available
Age Structure:	poor; last good year-classes are from the early 1970s
Distribution:	
Recent Exploitation Level:	low

AMERICAN PLAICE - 2+3K



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council noted that the spawning biomass was far below any previous level and that there were no signs of good recruitment for this stock. The Council recommended that there be no directed fishing for 2+3K American plaice in 1994 and that by-catches be limited to 500t. The Council re-iterated its recommendation in November 1994 for no directed fishing, together with a reduction in the by-catch limit to 100t. This advice was repeated for 1996.

With no new scientific data available, and no evidence of a change in status of this stock, the advice of previous years - no directed fishing and a by-catch TAC of 100t - was reiterated for 1997. It was also recommended that cooperative science-industry surveys be encouraged in an attempt to increase the data base on the current and ongoing status of this stock.. The recommendation for 1998 was that there be no directed fishery and that by-catch protocols be applied when prosecuting other fisheries.

1998 CONSULTATIONS:

Questions were asked about the possible decline of this stock as reported catch and landings data do not indicate any overfishing. Concern was expressed that the shrimp fishery, which began in the early 1980s could have played a role because of by-catches. It was noted that from June - July some big fish were found in spawning conditions in nets in the Petty Harbour area.

ANALYSIS:

The 1996 DFO Stock Status Report and the 1998 Newfoundland Region Groundfish Overview indicate that:

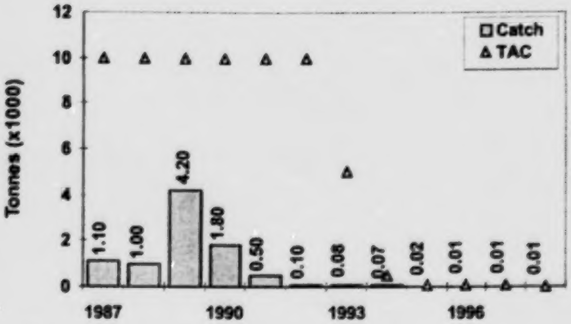
- **abundance and biomass are very low.**
- the spawning biomass is only about 2% of peak values.
- reported catches cannot explain the decline.
- in recent years recruitment has been low.
- continues to be no optimism about recovery.

Research vessel surveys continue to show that the stock is at a very low level. In Divisions 2J and 3K combined, the biomass index declined over 95% between 1982 - 83 and 1992 - 94.

RECOMMENDATIONS:

The FRCC recommends that:

1. **there be no directed fishing for 2+3K American plaice during 1999 and that by-catch protocols be applied when prosecuting other fisheries;**
2. **co-operative science-industry surveys be developed to increase the data base for this species; and,**
3. **DFO Science begin work to determine stock definition, as some stakeholders believe there may be separate stocks in Bays such as St. Mary's and Trepassey.**

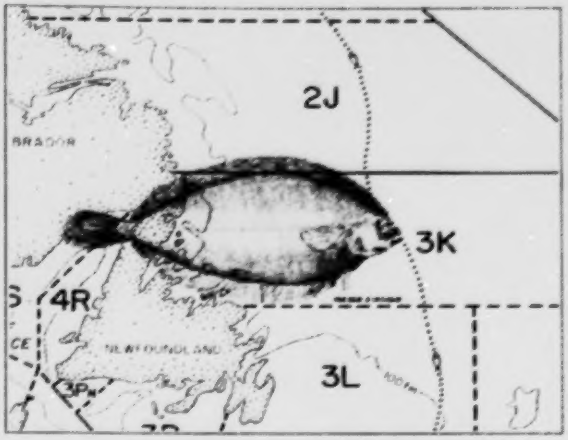


* 1998 Catch: as of Dec.2/98

COUNCIL'S VIEWS ON STOCK STATUS:

Overall stock Indicator:	very low
	Compared to average
Spawning biomass:	very low
Total Biomass:	very low; recent estimates only 10-15% of early 1980s
Recruitment:	poor
Growth and Condition:	not available
Age Structure:	gradual reduction in number of older fish; all age groups depressed
Distribution:	moved to deeper water in late 1980s
Recent Exploitation Level:	low; by-catch only

WITCH FLOUNDER - 2J3KL



HISTORY OF FRCC RECOMMENDATIONS:

In 1993, the Council noted that the biomass of witch flounder in 2J3KL was far below any previous estimate in the 15-year time series, and consequently recommended that, as a precautionary measure, the 1994 TAC for 2J3KL witch flounder be reduced to 1,000t. In November 1994, the Council recommended that there be no directed fishing for 2J3KL witch flounder in 1995 and that by-catches be limited to 100t in 1996. The Council repeated this recommendation for 1997.

In October 1996, the Council recommended that there be no directed fishing for 2J3KL Witch flounder in 1997 and that by-catches be limited to 100t. The Council also recommended that cooperative science-industry surveys should be encouraged.

For 1998, the Council repeated its recommendation regarding cooperative science - industry surveys and that there be no directed fishery and that by-catch protocols be applied when prosecuting other fisheries.

1998 CONSULTATIONS:

During the consultations in Grand Falls, it was noted that it may be difficult to understand why the stock has not improved until we can understand why it declined. At consultations here and in Clarenville it was believed that by-catches in the shrimp fishery in the early 1980's may have played a significant role in its decline.

ANALYSIS:

The 1998 Report of the NAFO Scientific Council indicate that:

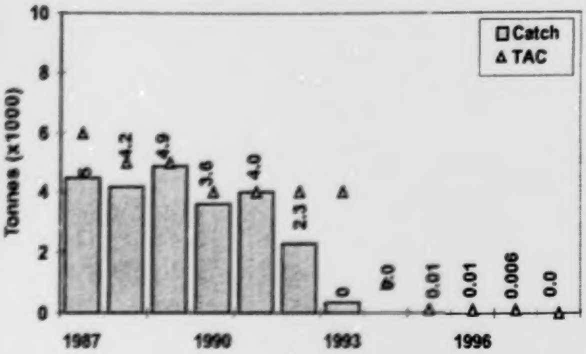
- this stock remains at a very low level.
- there are some indications of movement to deeper waters of 3L.

Witch is a slow-growing species that may live to 30 years. Age groups in the 2J3KL stock have been reduced substantially since the 1970s. There are fewer older fish now. Fishing has generally taken fish from pre-spawning and spawning concentrations. Recently, witch appears to have moved to deeper water (in excess of 900 m). Recent data on this stock indicate that it has dramatically declined since the 1980s; relative biomass in 1994 was estimated to be 4% of the 1986 level. Research surveys in 1996 found that witch was somewhat more abundant in the Flemish Pass area which could make it vulnerable to by-catch in the turbot fishery outside 200 miles and may have migrated from Canadian waters. Generally, the stock is at the lowest level ever observed and there are no signs of improving recruitment. The shrinking area of distribution of this stock, despite its low biomass, may increase its vulnerability to fishing.

RECOMMENDATIONS:

The FRCC recommends that:

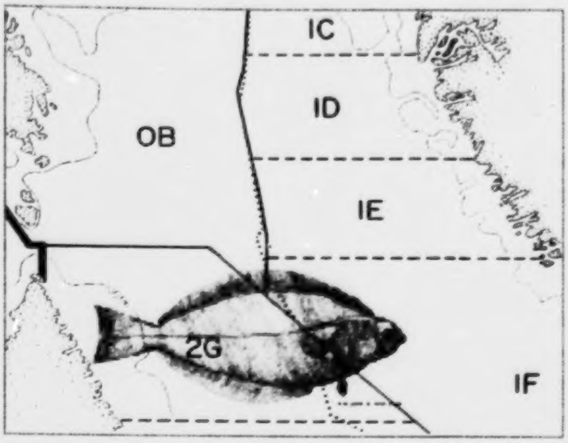
1 there be no directed fishing for 2J3KL witch flounder in 1999 and that by-catch protocols be applied when prosecuting other fisheries.



COUNCIL'S VIEWS ON STOCK STATUS:

Overall stock Indicator:	extremely low
	Compared to average
Spawning biomass:	very low
Total Biomass:	very low
Recruitment:	poor; no signs of improvement
Growth and Condition:	not available
Age Structure:	not available
Distribution:	shrinking; may have migrated to deeper waters in early 1990s
Recent Exploitation Level :	appears low but if stock has migrated to deeper waters outside the Canadian zone, could be vulnerable to unregulated fishing

GREENLAND HALIBUT - 0B+1B-F



HISTORY OF FRCC RECOMMENDATIONS:

In its first reports (November 1993 and June 1994) on Greenland halibut, the Council recommended that the TAC for Subareas 0+1 be set at 25,000t (12,500t for Subarea 0). Further work of the NAFO Scientific Council in June 1994 led to the recommendation that the 1995 TAC be set below 11,000t for Divisions 0B and 1B-F, i.e., below the offshore catch levels (11,000-15,000t) seen in recent years.

In November 1994, the Council recommended that the 1995 TAC be set below 11,000t and recommended that the conservation merits and feasibility of closing a spawning area in Davis Strait be evaluated in bilateral discussions with Greenland on appropriate sharing arrangements. The 1995 Canadian quota for Subarea 0 was set at 5,500t.

For 1996, the Council repeated its recommendations for a TAC below 11,000t and the feasibility of closing a spawning area in the Davis Strait. Once again in 1997 the Council recommended that Canada and Greenland seek consistency in controls on harvesting and that the feasibility of closing spawning and nursery areas be explored with Greenland. In addition the FRCC expressed concern about the emerging fishery by gillnets in this area and concern about potential for juvenile Greenland halibut by-catch in the shrimp fishery in this area.

RECOMMENDATIONS:

The FRCC recommends that:

1 the 1999 TAC for Greenland halibut in 0B+1B-F be set at 11,000t;

2 Canada and Greenland seek consistency in controls on harvesting Greenland halibut in sub area 0B+1B-F;

3 closed spawning areas and closed nursery areas be implemented in the Davis Strait in 1999; and

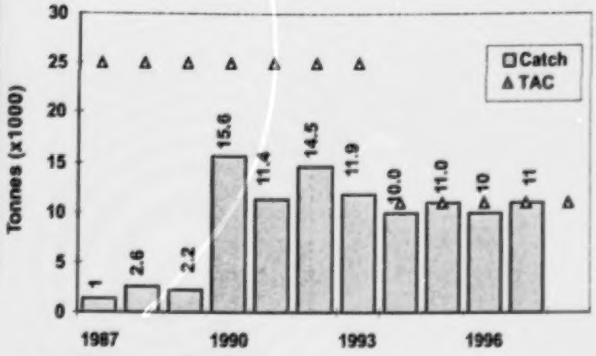
4 as by-catch of juvenile halibut in the Greenland shrimp fishery may become a problem for the stock, Canada pursue with Greenland the implementation of proper conservation measures (e.g., Nordmore grate become mandatory).

The FRCC continues to be concerned about the conduct of this fishery, especially with respect to the possible loss of gillnets, soak time, and the waste associated with ghost fishing and extended soak times, therefore, the FRCC recommends that:

5 fishing plans for 1999 be such that, net limits reflect the number that can be handled in a period of time that will minimize waste due to quality deterioration, and measures continue to be implemented to reduce net loss and the associated ghost fishing;

6 observers continue to be deployed in this fishery to gather information on soak times, discard levels, adherence to net limits, net loss and any other information that will assist in decision making related to the conservation of this stock; and

7 otter trawlers pursuing this fishery be required to use a minimum of 145mm diamond mesh until the results of the joint industry - DFO studies are available on the optimal mesh size and configuration to protect juveniles.



* 1998 Catch: as of Dec.2/98

1998 CONSULTATIONS:

During consultations in both Grand Falls and Clarenville, it was noted that this stock stands out as being almost the only groundfish holding its own and even getting stronger. This in the face of an active fishery and the existence of a shrimp fishery in Greenland waters that it is said take large amounts of turbot as by-catch. It was suggested that because the turbot probably spawn at a time and location when they are protected from fishing by ice cover and that this could be the reason.

During consultations in Clarenville the representatives of the Nunavut Wildlife Management Board expressed concern over the lack of scientific surveys conducted in the north. This concern was supported by others.

ANALYSIS:

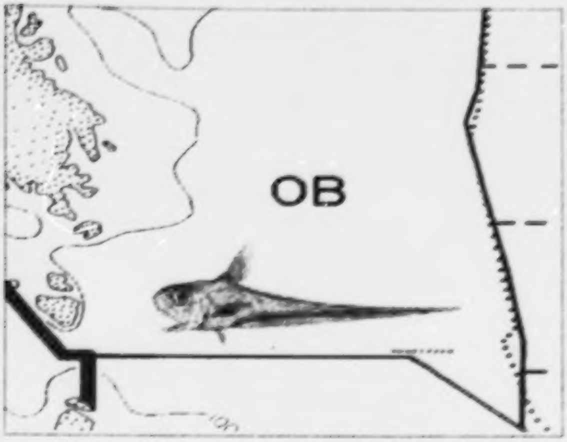
Catches peaked at 18,000t in 1992 but have been stable around 10,500t since then. The catch composition has been stable in recent years. Recruitment estimates at age 1 of the 1992 - 94 year - classes were lower than the presumably good 1991 year-class, but are still considered to be at or above average for the last decade. The 1995 year class was estimated at age 1 to be the highest in the time series, but at age 2 estimated at below average. The 1996 year-class is at the level of the relatively low 1990 year-class. The age composition in the catches has been stable in recent years. The decline in the stock observed until 1994 seems to have stopped and the stock has apparently stabilized at a lower level compared to the late 1980s and early 1990s. The NAFO Scientific Council recommends that the TAC for 1999 should not exceed the current level of 11,000t in Subarea 0 + Division 1A (offshore) +1BCDEF.

The Council was glad to see that DFO implemented its recommendations regarding the management of the gillnet fishery in 1998. However, the Council is still concerned with the soak time of gillnets and subsequent quality of the catch which could lead to discarding. The Council also fully supports the views of the NWMB, and others, that Science should carry out more scientific work in this area. **It is noted that most of the current work has been carried out in Greenland waters and that Canada has not conducted a survey in this area since 1986. As well the Council continues to support the view made during consultations in 1997 that alternative to gill netting this area, such as longlining, be explored.**

COUNCIL'S VIEWS ON STOCK STATUS:

Overall stock Indicator:	stable
	Compared to average
Spawning biomass:	unknown
Total Biomass:	lower than in late 1980s and early 1990s
Recruitment:	strong 1991 year-class; 1992-94 year-classes average; estimates of 1995 year-class variable; 1996 year-class relatively low
Growth and Condition:	unknown
Age Structure:	age composition stable in catches in recent years
Distribution:	normal
Recent Exploitation Level:	unknown

ROUNDNOSE GRENADIER - SUBAREA 0



ANALYSIS:

The 1998 NAFO Scientific Council Report notes that the stock found in the Davis Strait is probably connected to the other stocks in the North Atlantic. The stock component found in Subarea 0 +1 is at the margin of the distribution area. Previous Canadian and Russian surveys showed that most of the biomass generally was found in Subarea 1. The exploitation level is considered to be low in recent years and the stock seems to be at very low levels. The Science Council recommends that there be no directed fishing.

HISTORY OF FRCC RECOMMENDATIONS:

In its 1993 and 1994 reports, the Council recommended the TAC for Sub-area 0 roundnose grenadier be set at 3,000t. In its 1995 report, Council recommended that should there be directed fishing on this stock, it be done in the context of a scientifically conducted test fishery. In Building the Bridge, Council's November 1996 report, it was recommended that there be no directed fishery on this stock and cooperative industry-science surveys should be encouraged. For 1998, the Council continued its recommendation for no directed fishing.

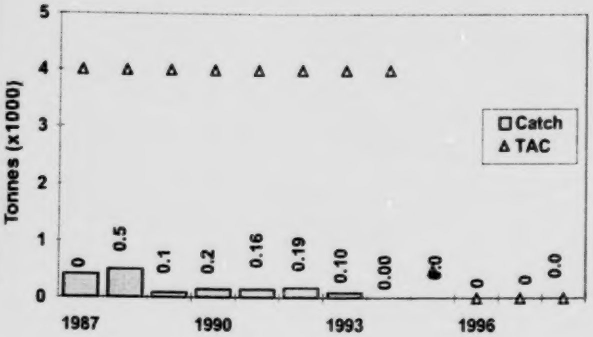
1998 CONSULTATIONS:

There were no specific comments on this stock during the 1998 consultations.

RECOMMENDATIONS:

The FRCC recommends that:

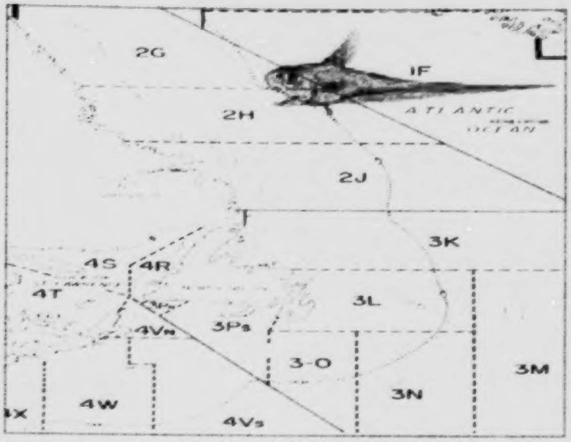
1 there be no directed fishing for roundnose grenadier in Subarea 0 in 1999.



COUNCIL'S VIEWS ON STOCK STATUS:

Overall stock Indicator:	very low
	Compared to average
Spawning biomass:	likely low (unspecified)
Total Biomass:	very low
Recruitment:	not available
Growth and Condition:	not available
Age Structure:	not available
Distribution:	unknown
Recent Exploitation Level :	low

ROUNDNOSE GRENADIER - 2+3



ANALYSIS:

The 1998 report of the NAFO Scientific notes that due to limited data it is not possible to determine the state of the stock. Reported catches for each of 1996 and 1997 are 50t, taken as bycatch. The Scientific Council notes that it is not possible to provide any advice for 1999.

HISTORY OF FRCC RECOMMENDATIONS:

In earlier reports, released in the fall of 1993, and 1994, the Council recommended that the TAC for roundnose grenadier be set at 4,000t in 1994 and again for 1995. The TAC was set at 500t for 1995. For 1996 and 1997, the FRCC recommended there be no directed fishing on roundnose grenadier in Subarea 2+3 and that cooperative industry science surveys would assist in furthering the knowledge on this stock. For 1998 the Council continued its recommendation that there be no directed fishery

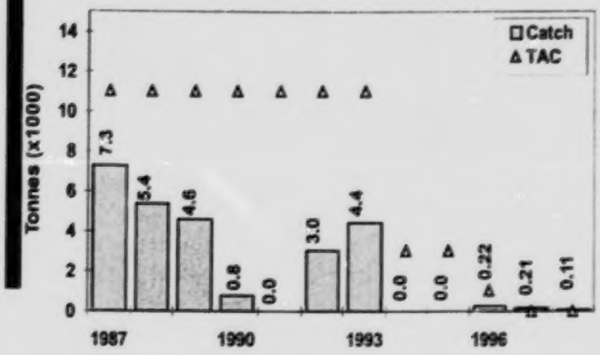
1998 CONSULTATIONS:

There were no specific comments on this stock during the 1998 consultations.

RECOMMENDATIONS:

The FRCC recommends that:

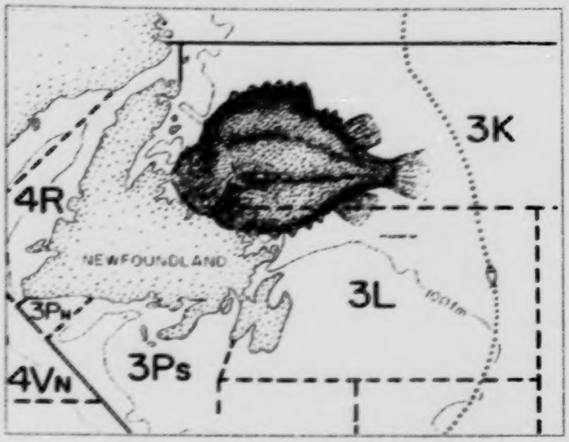
1 there be no directed fishing for roundnose grenadier in 2+3 in 1999.



COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator:	unknown
	Compared to average
Spawning Biomass:	unknown
Total Biomass:	unknown
Recruitment:	unknown
Growth and Condition:	unknown
Age Structure:	unknown
Distribution:	unknown
Recent Exploitation Level:	unknown

LUMPFISH



HISTORY OF FRCC RECOMMENDATIONS:

The FRCC first reported on this particular stock in 1995. The Council recommended that management measures, such as shortened season, be used to reduce the effort on this stock. It further recommended that roe content monitoring programs, similar to those employed in the capelin fishery, be established to ensure that fishing takes place at an appropriate time and that closed and protected areas be established for this stock.

In October 1996, the Council recommended that dramatic new management measures be taken to insure conservation of lumpfish in 1997 and that these measures include a combination of the following:

- roe content monitoring programs should be established to determine timing of the fishery to maximize yield/fish;
- closed and protected spawning areas must be established throughout the range of the stock;
- more localized management must be established;
- effort must be further reduced; and
- gear limits must be decreased and the season shortened.

The Council noted that unless these measures were effectively implemented, the closure of this fishery was imminent. For 1998, the Council re-iterated that measures taken to control effort in the past few years be continual and that fishers and Science gather more specific information on this stock through an Index Fisherman Program.

1998 CONSULTATIONS:

At consultations in Grand Falls it was noted that many fished lumpfish in 1998 because there was little else to do at the time. In both Grand Falls and Clarenville there was some concern expressed regarding opening dates. A drop in prices resulted in a drop in effort in many areas.

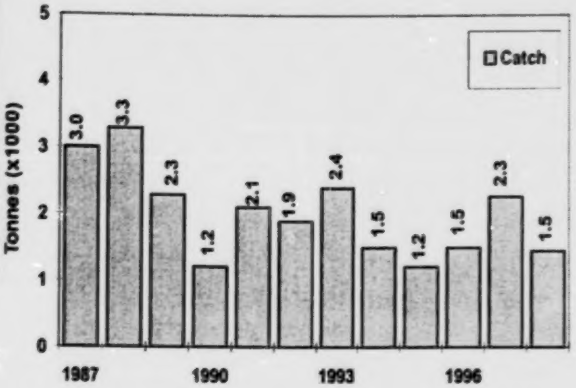
RECOMMENDATIONS:

The FRCC recommends that:

1 measures taken to control effort in the past few years should be continued;

2 fishers and managers assess their local stocks and implement appropriate conservation measures in agreement with the local stock status, e.g., full closures, rotating local closures, shortening seasons, effort reductions, and the Department provide the Council with the fishery status by these local areas at the end of the season; and,

3 fishers and science must continue to gather more information on this stock through the establishment of an Index Fishermen Program especially with respect to: catch and effort levels, spawning patterns, growth rates, maturation, population structure, temperature preferences and habitat preferences. Further recommendations for continuation of this fishery is incumbent upon information of this nature being provided to the council.



ANALYSIS:

The 1996 DFO Stock Status Report and the 1998 Newfoundland Region Groundfish Overview, indicate that:

- there is little scientific information and inadequate biological sampling.
- there has been a 40% decline in roe landings from the recent average.
- inshore fishermen are nearly unanimous in view that this stock is declining, especially in northern areas.

Lumpfish males establish breeding territories inshore; these may be used year after year. Data from studies which have monitored these territories indicate exceptional impact from the fishery. Landings increased to 2,000t with 3Ps at an all time high of 1,600t in 1997. Preliminary data for 1998 indicates a catch of around 1,400t. The lumpfish fishery is exclusively on pre-spawning mature females and therefore the spawning stock is vulnerable to over exploitation. Since the cod moratorium, there has been an increase in fishers entering this fishery. Research vessel surveys are not considered to be representative of the stock due to the seasonal migratory pattern of this species. There is insufficient new data to determine the status of this resource. The Council cannot emphasize too much its growing concern over where this stock is headed. A continuing fishery that targets only mature spawning females is a recipe for disaster.

The Council believes that in some areas the status quo is not acceptable and more restrictive measures in such localized areas are necessary.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall stock Indicator:	very low on North-east coast; stable on South coast
	Compared to average
Spawning biomass:	likely low on NE coast but seems higher and stable on S coast
Total Biomass:	likely low on NE coast but seems higher and stable on S coast
Recruitment:	unknown
Growth and Condition:	not available
Age Structure:	fishery is exclusively on mature females before spawning
Distribution:	seasonal migratory patterns; fishing concentrated on inshore spawning areas; distribution likely shifting due to stock decline in 3K and 3L
Recent Exploitation Level:	fishery regulated by effort; number of participants in fishery increased since cod moratorium; number of nets allowed and duration of fishery have been reduced in recent years

CHAPTER 3: GROUNDFISH STOCKS IN THE NAFO REGULATORY AREA

LETTER TO THE MINISTER

July 22, 1998

The Honourable David Anderson, P.C., M. P.
Minister of Fisheries and Oceans
200 Kent St.
Ottawa, Ontario
K1A 0E6

Dear Minister:

Section 4.5 of the Terms of Reference of the Fisheries Resource Conservation Council (FRCC) states:

> **"The Council may also advise the Minister on the position to be taken by Canada with respect to straddling and transboundary stocks under the jurisdiction of international bodies such as the Northwest Atlantic Fisheries Organization (NAFO)."**

Consequently, the FRCC has reviewed the Report of the NAFO Scientific Council with specific reference to matters of particular interest to Canada, and offers advice on Total Allowable Catches for 1999 and other conservation measures for NAFO managed stocks as well as 2J3KL cod and Greenland halibut in 2&3KLMNO. The FRCC also participated in government/industry consultations on this matter on June 25, 1998.

The FRCC notes that the status of these stocks in 1998 is much the same as in 1997. With the exception of yellowtail flounder in Divisions 3LNO and Greenland halibut in 2&3KLMNO, there is no indication of improved recruitment. Biomass levels are at historic lows and the outlook in the mid to long term is poor. With the lack of recruitment in four of these stocks, improvement in biomass levels is uncertain.

A. 2J3KL COD (NORTHERN COD)

Once Canada's largest cod stock on the East Coast, this stock has been declining since the early 1990s. Biomass is less than 10% of the long term average and shows limited signs of recruitment despite a moratorium since 1992. Recent year classes are exceptionally weak. Natural mortality has increased significantly by a factor of 3 to 4.

It is clear that the harp and hooded seal populations continue to grow at an alarming rate. In 1996, these populations have increased to 4.9 million and 600 thousand animals respectively and consumed 3.8 million tonnes of fish in Atlantic Canada. Of the total prey consumption, it is estimated that 73% comes from Divisions 2J3KL. The majority of groundfish consumed are pre-recruits to the commercial fishery. Without a doubt, this is having an extremely negative impact on stock recovery. Distribution of the cod is concentrated in the southern range of the stock where it could also be vulnerable to over-exploitation in the NAFO Regulatory Area. Despite an improvement in 1996, age at maturity has declined since 1991 which is indicative of a stock under stress.

The FRCC reiterates its recommendation, made in *Conservation Stay the Course* (1994) , for the development and implementation of "an action plan to achieve a meaningful reduction in the seal populations."

The FRCC recommends that Canada's position supports a continuing of the moratorium on fishing 2J,3KL cod in the NAFO Regulatory Area.

B. GRAND BANKS KEY STOCKS

There are six NAFO-managed straddling stocks on the Grand Banks which are of significant importance to Canada. These are:

American plaice in Divisions 3LNO
Witch flounder in Divisions 3NO
Yellowtail flounder in Divisions 3LNO
Cod in Divisions 3NO

Redfish in Divisions 3LN
Greenland halibut in Divisions 2&3KLMNO

The following table shows the TACs and catches since 1990:

Stock		90	91	92	93	94	95	96	97	98
Am. Plaice	**TAC**	24.9	25.8	25.8	10.5	4.8	0	0	0	0
3 LNO	**Catch**	32.5	34.7	13.4	17.1	7.4	0.6	0.9	1.4	
Yellow Tail	**TAC**	5	7	7	7	7	0	0	0	4
3LNO	**Catch**	13.8	16.3	10.2	13.6	2.1	0.1	0.3	0.8	
Witch	**TAC**	5	5	5	5	3	0	0	0	0
3NO	**Catch**	4.2	4.8	5	4.4	1.1	0.3	0.4	0.5	
Cod	**TAC**	18.6	13.6	13.6	10.2	6	0	0	0	0
3NO	**Catch**	29	29	12.6	9.7	2.7	0.2	0.2	0.4	
Red	**TAC**	25	14	14	14	14	14	11	11	0
3LN	**Catch**	29.1	25.8	27.3	21	6	2	0.5	0.6	
G. Halibut	**TAC**	50	50	50	50	25	27	27	27	27
2&3KLMNO	**Catch**	47.5	65	63.2	42-62	51	15	19	20	

As can be seen, with the exception of witch in Divisions 3NO and, more recently Greenland halibut and redfish, catches have significantly exceeded TACs. These excess catches have occurred in the Regulatory Area outside the 200 mile limit and have included large amounts of juvenile fish caught both by member and non-member countries. Canada's share of the TACs are: American plaice 98.5%; witch 60%; yellowtail flounder 97.5%; cod 47.6%; redfish 42.6%; and Greenland halibut 37%. The following highlights key information on these stocks based on the Report of the NAFO Scientific Council:

1. 3LNO AMERICAN PLAICE

Although once the largest flatfish fishery in the Northwest Atlantic, and despite having been under a moratorium since 1995, this stock remains at a low level and abundance continues to decline. The NAFO Scientific Council advises that there have been no strong year classes since 1987 and the population is composed of fish less than seven years old. Catches have more than doubled since 1995 (to 1,400t), despite the moratorium, mainly due to the catch of plaice in the Greenland halibut fishery and the unregulated skate fishery in the Regulatory Area. The FRCC has great concern about the increasing exploitation on this fragile resource. It is expected that by-catch will further increase in the reopened yellowtail flounder fishery in 3NO in 1998.

The FRCC supports the NAFO Scientific Council recommendation that:

(a) there be no directed fishery for American plaice in Divisions 3LNO in 1999.

The FRCC also recommends that:

(b) measures be undertaken to minimize the by-catch of American plaice in the Greenland halibut, yellowtail flounder and skate fisheries;

(c) the mesh size in the NAFO Regulatory Area be increased to 145 mm mesh;

(d) key juvenile nursery grounds be protected through the establishment of closed areas; and,

(e) there be 100% observer coverage in directed fisheries where American plaice is a by-catch.

2. 3LNO YELLOWTAIL FLOUNDER

The NAFO Scientific Council advises that, based on survey data, this stock has increased in size since 1994. The 1992 and 1993 year classes are well above the long term average and age structure has remained stable. The NAFO Scientific Council notes that a directed fishery on yellowtail flounder will result in a by-catch of American plaice and cod in 3NO and that this should be taken into account in recommending Total Allowable Catches.

The FRCC supports the NAFO Scientific Council recommendation that:

(a) a TAC for 1999 not exceed 6,000t;

(b) the directed fishery be confined to Divisions 3NO;

(c) this fishery be carefully monitored;

In addition, the FRCC recommends that:

(d) measures be undertaken to minimize the by-catch of American plaice and cod in this fishery;

(e) key juvenile fishing areas be protected by implementing closures;

(f) a minimum mesh size of 145 mm be implemented;

(g) fishing on spawning concentrations be minimized; and,

(h) there be 100% observer coverage in this fishery.

3. 3NO WITCH

The NAFO Scientific Council advises that the 1998 biomass estimate for witch in 3NO is the lowest observed and there is evidence that stock size is continuing to decline despite a moratorium since 1995.

The FRCC supports the NAFO Scientific Council recommendation that:

(a) there be no fishing on 3NO witch in 1999 to allow for stock rebuilding; and

(b) the by-catch of this species be kept at the lowest possible level.

4. 3NO COD

The NAFO Scientific Council advises that biomass levels for this stock are at an all time low and year class strength in the population is very weak. Recruitment is poor and the once dominant 1989 and 1990 year classes are at low levels.

The FRCC supports the NAFO Scientific Council recommendation that:

(a) there be no directed fishing for cod in 3NO in 1999; and

(b) by-catches of this stock be kept at the lowest possible levels.

5. 3LN REDFISH

Despite a TAC of 11,000t in 1997, almost no effort was deployed in this fishery because of poor catch rates.
The NAFO Scientific Council advises that biomass levels in 3L are low and recruitment in this area has been poor since the mid 1980s. There is evidence of an increase in biomass in 3N due to the growth of the 1986 and 1987 year classes but recruitment since that time has been weak. This stock remains at low levels.

The FRCC supports the NAFO Scientific Council recommendation that:

(a) there be no directed fishery in 3LN redfish in 1999; and,

(b) by-catches be kept at the lowest possible level.

6. GREENLAND HALIBUT 2&3KLMNO

The NAFO Scientific Council advises that above average recruitment in the period 1990-1995 has led to improvement in biomass levels in the 2 and 3KLMNO Greenland halibut stock. While the fishable biomass was below the long term average in 1997, it is expected to increase in 1998 and 1999 as these year classes recruit to the fishery. Catches consist mainly of immature fish which results in loss of potential yield from the stock. Biomass distribution indicates a small proportion (19%) of the biomass is located in Divisions 3LMNO.

Juvenile Greenland halibut in the shrimp fishery must be addressed.

The NAFO Scientific Council advises that an increase in catch in 1999 to about 30,000t should not impede recovery. The FRCC does not support an increase in the TAC to 30,000t in 1999 unless appropriate measures are implemented to improve conservation.

Therefore, the FRCC recommends that:

(a) minimum mesh size be increased to 145 mm in the NAFO Regulatory Area to protect juvenile Greenland halibut;

(b) the by-catch of American plaice be kept at the lowest possible levels;

(c) the by-catch of Greenland halibut in the Canadian 3K shrimp fishery be kept at the lowest possible levels; and,

(d) there be 100% observer coverage in this fishery.

Regardless of the TAC level set for 1999, the FRCC considers it essential that the above conservation measures be implemented.

In addition, the FRCC recommends that:

(e) research continue to define biomass distribution and abundance in the various management areas throughout the stock to assess the impact of high fishing mortality on the southern portion of the stock.

CONCLUSIONS:

With the exception of yellowtail flounder and Greenland halibut estimated biomass levels for the above stocks are at or near the lowest levels ever observed and stock rebuilding potential is uncertain. Measures adopted by the NAFO Fisheries Commission have, for the most part, not stopped the continuing decline of these stocks. To be effective in reversing the decline, a more radical approach is necessary. By-catch levels of stocks currently under moratoria are of great concern to the FRCC and could be impeding stock recoveries.

The FRCC recommends that, with the exception of yellowtail flounder and Greenland halibut, Canada's position be a continued moratorium on fishing the above stocks both inside and outside the 200 mile limit until the current declines are arrested and sufficient rebuilding occurs.

In addition to the above stocks for which we have given specific recommendations, the FRCC fully supports the NAFO Scientific Council recommendations for continued moratoria on 3M cod and 3M American plaice. We also believe that the moratorium on 3NO capelin should be continued.

C. EXPLOITATION OF UNREGULATED SPECIES

There continue to be groundfish fisheries taking place in the NAFO Regulatory Area in an unregulated manner, i.e. no TAC levels. The catch of skate, for example, has doubled from 1994 to 1997 from 5,000t to 10,000t respectively. An increase of this magnitude is certainly one which raises serious conservation concerns for this stock. In addition, there are multispecies ramifications for groundfish resources in the area that are in a severely depressed state. For example, it is believed that the high increase of catches of American plaice in Divisions 3LNO is largely attributable to the increased catch of skate in the NAFO Regulatory Area. We are also aware that there is an unregulated fishery for roughhead grenadier which raises similar concerns.

The FRCC believes that, as a precautionary measure, catches of unregulated species must be controlled to avoid overexploitation and possible stock collapse. **The FRCC recommends that NAFO adopt measures to ensure that catches of unregulated species do not exceed 1994 levels in the Regulatory Area. In addition, the NAFO Scientific Council should be requested to recommend sustainable harvest levels.**

D. CONSISTENCY IN CONSERVATION MEASURES

Conservation measures adopted by the NAFO Fisheries Commission should be consistent with those that already apply in Canadian waters. For example, the use of conservation harvesting plans, small fish protocols, mandatory dockside monitoring and closures during peak spawning periods are common features of Canada's domestic fishery that would greatly improve the NAFO conservation regime.

Canadian harvesters must not bear the burden of conservation alone in the management of these fishery resources.

E. THE CANADIAN NAFO POSITION

The FRCC fully supports a Canadian position with the following objectives:

1 The implementation of an enforcement program that is truly effective. An integral part of this package must be an observer program with 100% coverage and an effective reporting system that is a permanent feature of the NAFO conservation regime. Consistency in its application among all NAFO Contracting Parties is essential.

2 The adoption of the advice of the NAFO Scientific Council with respect to establishment of annual Total Allowable Catches and other conservation measures as well as the additional conservation measures set out in this document.

3 The continuation of the moratorium on fishing cod in 3L in the NAFO Regulatory Area.

4 The continuation of the moratorium on fishing shrimp in 3LNO until such time as cod and other groundfish species have recovered.

5 With the exception of redfish, an increase in minimum mesh size to 145mm.

6 The continuation of diplomatic efforts to eliminate uncontrolled fishing by Non-Contracting Parties and the reflagging of vessels in an effort to circumvent conservation requirements in the NAFO Regulatory Area.

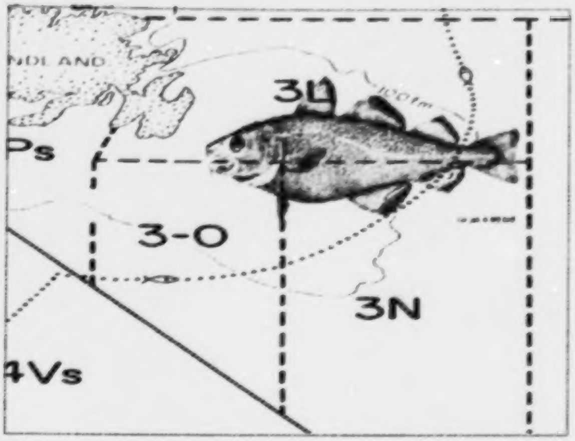
We trust these comments are helpful to you and wish you the best in the upcoming NAFO meetings.

Sincerely yours,

Fred Woodman

Fred Woodman
Chairman

COD - 3NO



HISTORY OF FRCC RECOMMENDATIONS:

In 1994, the NAFO Scientific Council warned that the spawning stock biomass could not begin to recover unless the 1989 and 1990 year-classes survive to maturity. In particular, they indicated that rebuilding would not happen if fisheries on immature fish were to continue at the then current high levels. In June 1995, NAFO scientists indicated that this stock was at an all time low in 1994 and was represented mainly by 2 year-classes (those of 1989 and 1990). They also noted that the year-classes since 1990 appeared to be weak and the estimates of the 1989 and 1990 year-classes, which were believed to be average, were much lower than previously estimated. The NAFO Scientific Council recommended that there be no direct fishing for cod in 1996, 1997 and again in 1998 and that by-catches in fisheries targeting other species should be kept at the lowest possible level. Their recommendations are unchanged for 1999 and the Council points out that the most recent surveys suggests that all year-classes are now at a low level and the 1996 biomass is estimated to be at an extremely low level.

In its August 1994, 1995, 1996 and 1997 letters to the Minister of Fisheries and Oceans, the Fisheries Resource Conservation Council recommended a continuation of the moratorium.

In September 1997, the NAFO Fisheries Commission agreed to continue the moratorium (in place since 1995) on directing for cod in 3NO in 1998.

ANALYSIS:

The June 1998 report of the NAFO Scientific Council makes the following observations:

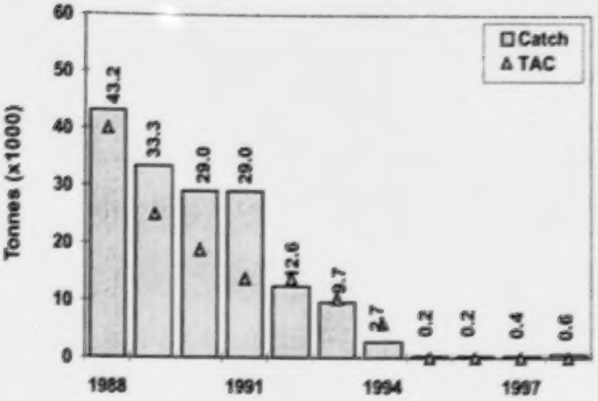
- biomass at extremely low level.
- stock at an all time low with weak representation from all year-classes.
- all recent (since 1990) year-classes are now at a low level.
- no analytical assessment possible due to lack of biological sampling.

The Council shares the NAFO Scientific Council concern with the current low levels of biomass and the lack of recruitment for this stock. Survey data used in estimating recent year-classes indicates that recruitment has been almost non-existent since the 1990 year-class. The medium term indicates poor prospects due to low spawner biomass, low recruitment and high mortality. Recovery will require a number of relatively strong year-classes that survive to maturity,

RECOMMENDATIONS:

The FRCC supports the NAFO Scientific Council recommendation that

1. **there be no fishing for cod in 3NO in 1999 to allow for stock rebuilding; and**
2. **bycatches of this stock be kept at the lowest possible levels.**

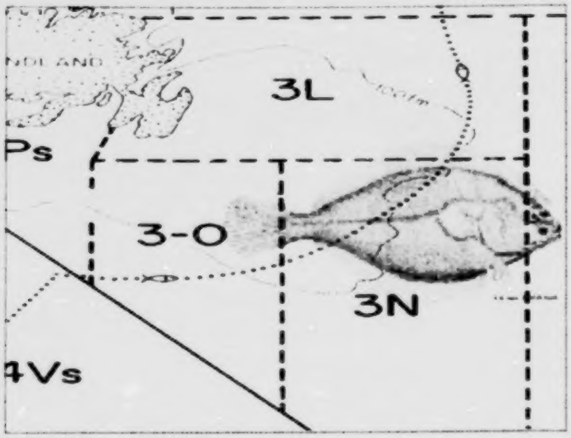


rebuilding the spawner biomass. Consequently, the Council considers that no directed fishing should take place in 1998 and that by-catches should be kept to the lowest possible level.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall stock Indicator:	very low level
	Compared to average
Spawning biomass:	likely at very low level
Total Biomass:	at historically low levels
Recruitment:	all year classes at low levels
Growth and Condition:	no special comment
Age Structure:	all year classes weak
Distribution:	no special comment
Recent Exploitation Level:	under moratorium since 1994

AMERICAN PLAICE - 3LNO



HISTORY OF FRCC RECOMMENDATIONS:

In the June 1994 Report of the NAFO Scientific Council, scientists indicated that the abundance of American plaice in 3LNO was at a record low level making stock rebuilding uncertain and recommended no fishing for 1995. Concerns persisted and their recommendations for 1996 and 1997 echoed those for 1995, but adding that by-catches should also be reduced to the lowest possible level. Given the extremely low population size, the concerns with respect to the spawning biomass, and the apparently large mortality on juvenile plaice, the NAFO scientists continued their same recommendation for 1998 and now for 1999.

In its letters of August 1994, 1995 and 1996 to the Minister of Fisheries and Oceans, the Fisheries Resource Conservation Council recommended continuing the moratorium for American plaice in Divisions 3LNO. The Council also pointed at the need to address the concerns raised by the exploitation of immature fish in directed fisheries by non-Contracting Parties, as well as the suspected high and increasing by-catches of American plaice in the Greenland halibut fishery by both Contracting and non-Contracting Parties. The Council was particularly concerned with the low levels of biomass and the apparent lack of recruitment for this stock.

In its August, 1997 letter to the Minister of Fisheries and Oceans, the FRCC again recommended continuing the moratorium for 1998 including implementing measures to minimize by-catches in the Greenland halibut fishery including an increase in the minimum mesh size to 145 mm. The Council also recommended protecting juvenile nursery grounds through the establishment of closed areas to all fishing activity.

In September 1997, the NAFO Fisheries Commission agreed to continue the moratorium (in place since 1995)on fishing 3LNO American plaice in 1998 but did not increase mesh size or implement any other measures to protect juvenile nursery areas.

ANALYSIS:

The June 1998 report of the NAFO Scientific Council makes the following observations:

- stock at a low level.
- biomass not increasing and abundance continues to decrease.

RECOMMENDATIONS:

The FRCC supports the NAFO Scientific Council recommendation that:

1 **there be no directed fishery for American plaice in Divisions 3LNO in 1999.**

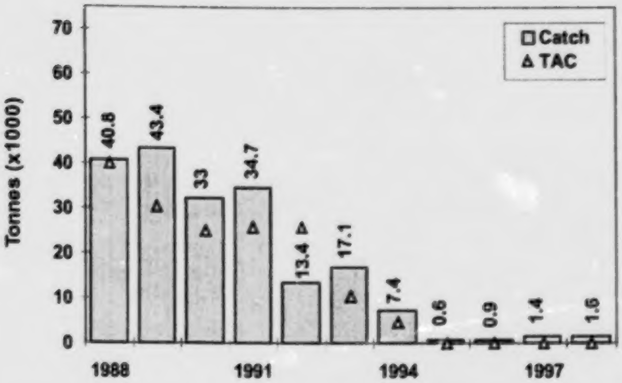
The FRCC also recommends that:

2 **measures be undertaken to minimize the by-catch of American plaice in the Greenland halibut, yellowtail flounder and skate fisheries;**

3 **the mesh size in the NAFO Regulatory Area be increased to 145 mm mesh;**

4 **key juvenile nursery grounds be protected through the establishment of closed areas; and,**

5 **there be 100% observer coverage in directed fisheries where American plaice is a by-catch.**



- No good year-classes since 1987.
- Stock composed of fish less than 7 years old.

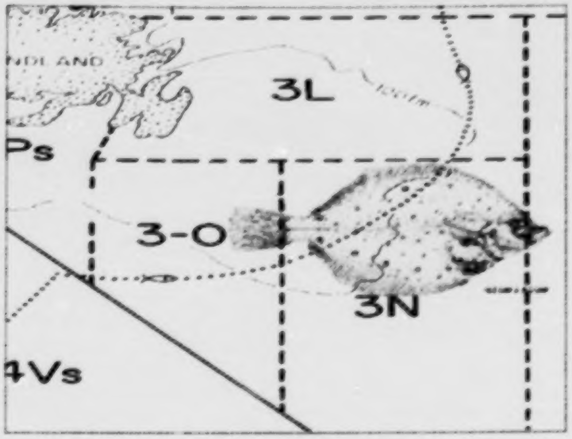
Although once the largest flatfish fishery in the Northwest Atlantic, and in spite of being under a moratorium since 1995, surveys suggest that this stock has reached a very low level and could still be in decline.

The Council continues to believe that a recovery of this stock is unlikely in the short term.

COUNCIL'S VIEWS ON STOCK STATUS

Overall stock Indicator:	very low
	Compared to average
Spawning biomass:	very low
Total Biomass:	very low
Recruitment:	no good year-classes since 1987
Growth and Condition:	no special observation
Age Structure:	stock composed mainly of fish < 7 years old
Distribution:	no special observation
Recent Exploitation Level:	under moratorium

YELLOWTAIL FLOUNDER - 3LNO



HISTORY OF FRCC RECOMMENDATIONS:

In its June 1994 report, the NAFO Scientific Council noted that the stock remained at a low level and that potential growth on the stock from the relatively large 1984-86 year-classes had not occurred, likely because of large catches of these cohorts as juveniles by fisheries in the Regulatory Area, and because the TAC had been exceeded each year from 1984. To rebuild this stock as fast as possible, NAFO scientists recommended that no fishing be permitted in 1995.

In its June 1995 Report, the NAFO Scientific Council re-affirmed its previous concerns and also noted that the geographic distribution of this stock had contracted, making it very vulnerable to over-exploitation. They recommended that there be no directed fishing in 1996 and that by-catches be reduced to the lowest possible level, a recommendation that they repeated for 1997. In its June 1997 report, the scientists noted that based on 6 additional surveys since the 1996 assessment, the current view was that the stock size had increased since 1994 although the level of this increase could not be quantified. The Scientific Council noted that the stock should be able to sustain a limited fishery in 1998 and recommended that the TAC not exceed 4,000t. Scientists noted that a precautionary approach should he taken, however, as any directed fishery for yellowtail would result in by-catches of American plaice and cod.

In its June 1998 report, the Scientific Council, recommends a TAC of 6,000t for 1999 and re-emphasizes its caution regarding by-catches of American plaice and cod.

In its letters of August 1994, 1995 and 1996 to the Minister of Fisheries and Oceans, the Fisheries Resource Conservation Council recommended the continuation of the moratorium for

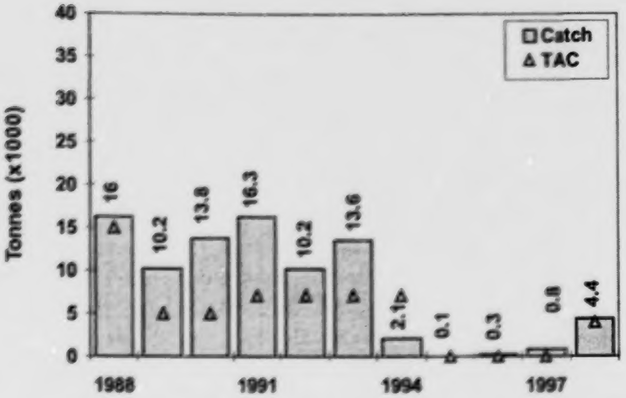
RECOMMENDATIONS:

The FRCC supports the NAFO Scientific Council recommendation that:

1. a TAC for 1999 not exceed 6,000t;
2. the directed fishery be confined to Divisions 3NO;
3. this fishery be carefully monitored;

In addition, the FRCC recommends:

4. measures be undertaken to minimize the by-catch of American plaice and cod in this fishery;
5. key juvenile fishing areas be protected by implementing closures;
6. a minimum mesh size of 145 mm be implemented;
7. fishing on spawning concentrations be minimized; and,
8. there be 100% observer coverage in this fishery.



1995, 1996 and 1997. The Council also pointed out the need to address the concerns raised by the exploitation of immature fish in the directed fisheries in the Regulatory Area by non-Contracting Parties. The Council was particularly concerned with the low levels of biomass and the lack of recruitment for this stock.

At its September 1996 meeting, the NAFO Fisheries Commission agreed to continue the moratorium in 1997 (in place since 1995).

In its August 1997 letter to the Minister of Fisheries and Oceans, the Council recommended a TAC of 4,000t for 1998, provided a number of specific conditions were met to protect juvenile yellowtail as well as to keep by-catches of American plaice and cod to the lowest possible level. The NAFO Fisheries Commission set the 1998 TAC at 4,000t.

ANALYSIS:

The June 1998 report of the NAFO Scientific Council makes the following observations:

- stock size has increased based on 7 surveys conducted since 1994.
- 1992 and 1993 year-classes are well above the long term average (since 1984).
- age structure has remained stable in all surveys.

The view of the Scientific Council is that the stock size has increased over the past year and the stock is perceived to be at a level close to that of the mid-1980s.

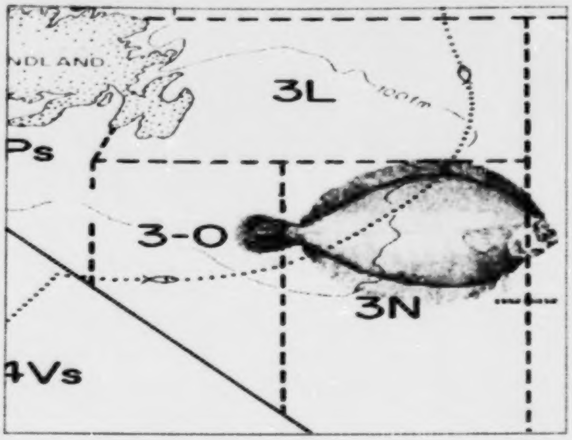
The FRCC fully supports the recommendations of

the NAFO Scientific Council to delay the beginning of the fishery until after peak spawning has taken place, to confine the yellowtail fishery to divisions 3NO, and to ensure that careful monitoring and sampling take place. Because by-catches of American plaice could be substantial in this fishery and because of the necessity to protect juvenile flatfish in the known nursery areas, the FRCC also considers that any fishery on yellowtail should be carried out under strict small fish protocols.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall stock Indicator:	gradual improvement
	Compared to average
Spawning biomass:	improving
Total Biomass:	appear to have returned to a level close to that of the mid-1980s
Recruitment:	the 1992 and 1993 year-classes well above average
Growth and Condition:	weight at age stable
Age Structure:	stable, with several cohorts
Distribution:	mainly concentrated in 3NO; low in 3L but some expansion in 3L may be taking place
Recent Exploitation Level:	has been reduced due to moratorium

WITCH FLOUNDER - 3NO



HISTORY OF FRCC RECOMMENDATIONS:

In June 1994 the NAFO Scientific Council indicated that this stock was likely at a very low level and recommended that no fishing be permitted on witch flounder in Divisions 3NO in 1995 in an effort to rebuild this stock to former levels. The Scientific Council re-iterated the same recommendation for 1996 but added that by-catches should also be reduced to the lowest possible level. The scientists made the same recommendations for 1997 and 1998.

In its letters of August 1994, 1995, 1996 and 1997 to the Minister of Fisheries and Oceans, the Fisheries Resource Conservation Council recommended a continuation of the moratorium.

In September 1997, the NAFO Fisheries Commission agreed to continue the moratorium (in place since 1995) on fishing 3NO witch flounder in 1998 and to keep by-catches to the lowest possible level..

ANALYSIS:

The June 1998 report of the NAFO Scientific Council makes the following observations:

- the 1998 biomass estimate is the lowest observed.
- data suggests stock continuing to decline.
- stock remains at a low level.

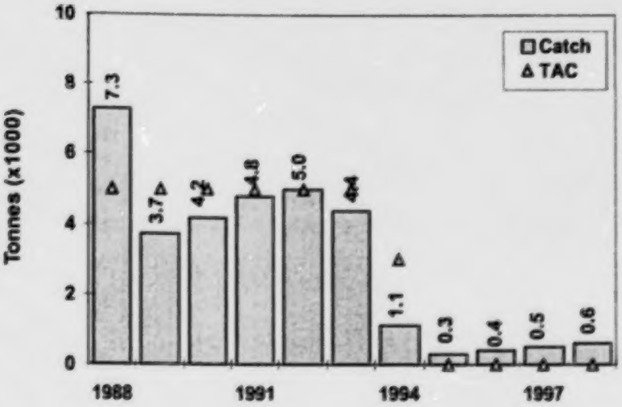
The Council believes that this stock remains at a very low level and the at the moratorium, along with a reduction in by-catches in other fisheries, should be continued in 1999.

RECOMMENDATIONS:

The FRCC supports the NAFO Scientific Council recommendation that:

1 there be no fishing on 3NO witch in 1999 to allow for stock rebuilding; and

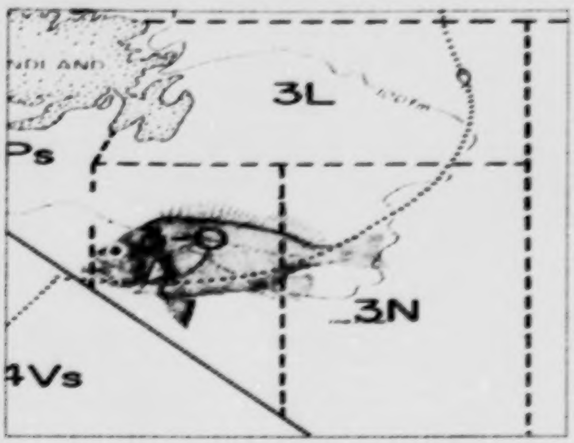
2 the bycatch of this species be kept at the lowest possible level.



Council's views on Stock Status:

Overall stock Indicator:	very low
	Compared to average
Spawning biomass:	likely at low level
Total Biomass:	low; the 1998 survey estimate is lowest observed
Recruitment:	no observation
Growth and Condition:	no observation
Age Structure:	no data
Distribution:	no special observation
Recent Exploitation Level:	under moratorium

REDFISH - 3LN



HISTORY OF FRCC RECOMMENDATIONS:

In its 1994 report, the NAFO Scientific Council noted that there was no estimate of recruitment available but that it appeared poor in Division 3L since the early 1980s and that available indices exhibited considerable between-year variability but generally indicated a stock at a low level, especially in 3L. Their recommendation for 1995 was for a total catch not to exceed 14,000t.

In its June 1995 report, the Scientific Council concluded that redfish abundance was very low in Division 3L, with no sign of good recruitment. In Division 3N, they observed that the stock has declined from 1984 to 1991 but that "the status since then is uncertain`` and made the same recommendation for 1996 as for 1995. In 1996, NAFO scientists, although noting that there was concern for the future given the general lack of good recruitment, had no basis to change their previous recommendation and for 1997 recommended that catches should not exceed 14,000t. In its June 1997 report, the Scientific Council noted that the stock appeared to be at a very low level and recommended that there be no directed fishing in 1998 and by-catches be kept at the current low level, recommendations that were accepted by the Fisheries Commission.

In its June 1998 report, NAFO scientists have re-affirmed earlier statements that, based on available data, the stock appears to be at a very low level. However, there are indications of some increase in 3N due to growth of the relatively strong 1986-87 year-classes. They recommend continuation of no directed fishing in 1999 and that by-catches be kept to the lowest possible level.

The Fisheries Resource Conservation Council made no specific recommendation on this stock for 1995. In its August 1995 letter to the Minister of Fisheries and Oceans, the Council concluded that a cautious approach was crucial and that the TAC for 1996 should be substantially reduced from the then current level of 14,000t, probably to a level below the 1994 catch of 7,000t. The NAFO Fisheries Commission reduced the 1996 TAC to 11,000t. .

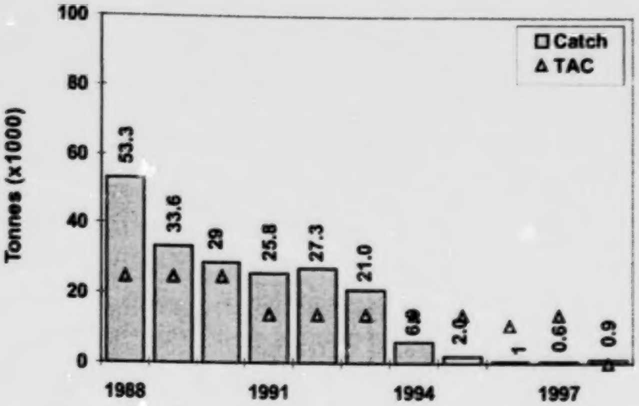
In its August 1996 letter to the Minister of Fisheries and Oceans, the FRCC recommended a substantial reduction in this TAC. In September 1996, the NAFO Fisheries Commission set the TAC for 1997 at 11,000t.

The FRCC also cautioned that any expansion of the 3M shrimp trawl fishery into 3LN should be discouraged. The FRCC noted with concern the high discard rate of small flatfish and redfish in other shrimp fisheries and the effect this could have on recruitment and loss of yield for these stocks, which were at critically low levels. Given

RECOMMENDATIONS:

The FRCC supports the NAFO Scientific Council recommendation that:

1. **there be no directed fishery in 3LN redfish in 1999;**
2. **bycatches be at the lowest possible level; and,**
3. **a joint industry-science investigation into the relationship between mixing of the 3LN and 3O redfish stocks be undertaken.**



these reasons, the FRCC recommended that the approach taken by Canada at NAFO in the previous year with respect to any 3LN shrimp trawl fishery be continued.

In its August 1997 letter, the FRCC recommended continuation of the no directed fishery for 1998 and that by-catches be kept to the lowest possible level. The Council also re-iterated its recommendation concerning expansion of the 3M shrimp fishery into 3LN.

ANALYSIS:

The June 1998 report of the NAFO Scientific Council makes the following observations:

- biomass low in 3L , where poor recruitment has persisted since early 1980s.
- little or no sign of good recruitment since 1986 and 1987 year classes.
- stock at a very low level.

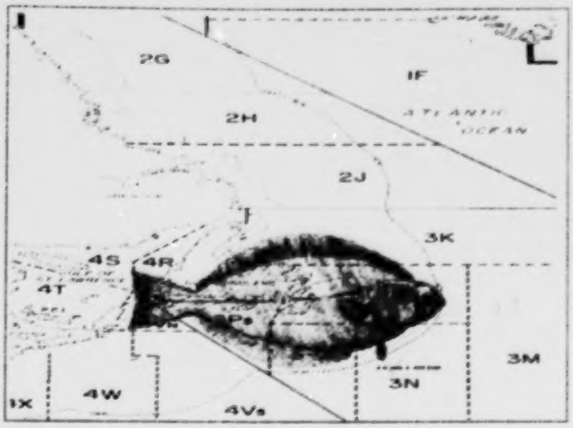
The Council notes that the catch in 1997 (600t) was the second lowest historically (453t in 1996). The Council considers that the shortfall of the catch below the TAC in recent years is largely the result of unsuccessful commercial fisheries carried out by member states. This is likely an indication of the poor status of the stock. With no sign of good recruitment since the 1986-87 year classes, the prospects for rebuilding the 3LN redfish stock are poor.

The Council continues to believe that an expansion of the shrimp trawl fishery from 3M to 3LN should be discouraged so that juvenile redfish are given maximum protection. The Council believes that the approach taken by Canada at NAFO with respect to this possible expansion should be continued.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall stock Indicator:	very low
	Compared to average
Spawning biomass:	likely very low level
Total Biomass:	very low level
Recruitment:	little sign of good recruitment after 1986-87 year classes
Growth and Condition:	typically slow growth
Age Structure:	dominated by 1986-87 year classes
Distribution:	no special comment
Recent Exploitation Level:	low; reduced effort since 1994

GREENLAND HALIBUT - 2 + 3KLMNO



HISTORY OF FRCC RECOMMENDATIONS:

In August 1993, the Council called for significant reductions in catches in the NAFO Regulatory Area and for a joint commitment to address scientific questions related to stock structure. For 1994, the Council concluded that the TAC should be reduced substantially and that catches in the order of the historical catch level of 25,000t should be a maximum level.

In June 1994, the Council noted the absence of controls on the foreign fishery outside 200 miles and recommended that all means be taken by Canada to limit the effort on this stock. In November 1994, the Council reiterated that catches in the order of the historical catch level of 25,000t should be a maximum level.

The NAFO Scientific Council concluded in June 1995 that the TAC for Greenland halibut in 2+3KLMNO should continue to be set at levels well below the catches achieved in previous years until it became clear that the stock was increasing. In addition, the Scientific Council recommended that measures be considered to reduce, as much as possible, the exploitation of juvenile Greenland halibut.

In August 1995, the FRCC re-iterated the need for maintaining reduced TACs. The conclusion of the Scientific Council that the large catches of immature Greenland halibut were a major impediment to stock rebuilding was noted. The Council suggested that Canada's objective for the near future should be to rebuild the stock to biomass levels of the early 1980s in order to support a sustainable fishery in the long-term. The NAFO Fisheries Commission concluded at the September 1995 meeting that the 1996 TAC would be set at 20,000t for Greenland halibut in 3LMNO, with an additional TAC of 7,000t to be allowed in SA2+3K (Canada only).

In 1996, the Council indicated that the above-average year-classes from the 1990's must be protected to allow the stock to rebuild and that catching large

RECOMMENDATIONS

The FRCC recommends that:

1 measures be taken to protect Greenland halibut juveniles in 2+3 such as small fish protocols;

2 Canada continue to propose to NAFO that the minimum mesh be increased to 145mm in the NAFO Regulatory Area; and

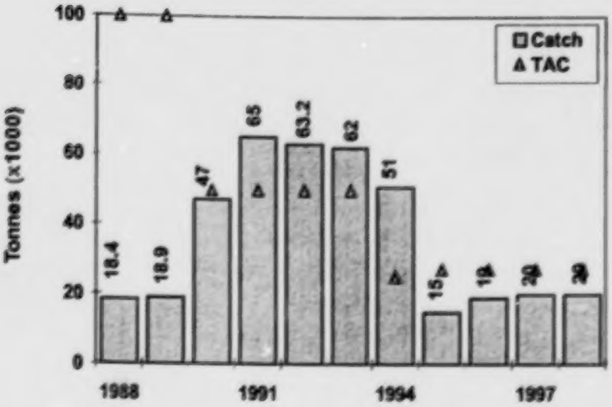
3 the by-catch of American plaice be kept to the lowest possible level.

Following the September 1998 NAFO Annual meeting, the FRCC further recommends that:

4 efforts by DFO Science to determine distribution and abundance (by management area) through out the stock area continue with a view to presenting new information for consideration by the NAFO Scientific Council in June 1999;

5 otter trawlers pursuing this fishery be required to use a minimum of 145mm diamond mesh until the results of the joint industry - DFO studies are available on the optimal mesh size and configuration to protect juveniles; and

6 the by-catch of Greenland halibut in the Canadian 3K shrimp fishery be monitored closely and be kept at the lowest possible level.



numbers of these fish as juveniles would waste the potential for rebuilding the stock. In September 1996, the NAFO Fisheries Commission concluded that the 1997 TAC would continue to be set at 20,000t for Greenland halibut in 3LMNO. The Canadian quota for 1997 in 2+3K was established at 7,000t in keeping with the FRCC recommendations. Again for 1998, the Council recommended the Canadian quota in 2+3K remain at 7,000t.

1998 CONSULTATIONS:

During the 1998 consultations, concern was raised regarding the extent of by-catch of this stock in the new 3K shrimp fishery. It was noted that the distribution of this stock has changed over time. The stock used to be fished in the Bays but is now more of an offshore fishery in deeper water. In Clarenville, stakeholders noted that both this and the stock in 0+1 were becoming important stocks for fishermen in the north and in Sub-area 2+3.

ANALYSIS:

The June 1998 report of the NAFO Scientific Council makes the following observations:

- fishing mortality not precisely known, but believed to be above sustainable levels during 1990-94.
- above average recruitment is indicated for all year classes from 1990-95.
- indices of fishable biomass well below average in 1997, but should increase in 1998-99 as some of these year classes recruit to fishable status.

The NAFO Scientific Council notes that the fishable stock should continue to increase. It further notes that while it is unable to advise on a specific TAC for 1999, an increase in catch from 1996-97 levels (20,000t) to about 30,000t should not impede recovery. It also recommends that measures be considered to reduce, as much as possible, the exploitation of juveniles and the by-catch of American plaice. The FRCC is encouraged by the signs of good recruitment and notes that continued conservation measures should allow these year classes to grow and contribute to the spawning biomass in the near future provided that juveniles receive adequate protection.

Despite these positive signs, we believe it would be premature at this stage to increase catch levels until the stock has benefited more substantially from this recruitment.

The Council notes that catches from this stock continue to consist mainly of immature fish and believes that additional measures such as increased mesh size and small fish protocols should be implemented in the NAFO Regulatory Area so as to be consistent with similar practices inside the Canadian zone.

The council wrote to the Minister of Fisheries and Oceans prior to the 1998 NAFO Meeting stating that it did not support the NAFO Scientific Council's view

COUNCIL'S VIEWS ON STOCK STATUS:

Overall stock Indicator:	improving
	Compared to average
Spawning biomass:	fishable biomass still below average
Total Biomass:	continuing to show signs of recovery
Recruitment:	good year-classes since 1990
Growth and Condition:	no special observation
Age Structure:	older age-groups remain at low levels
Distribution:	fall surveys show that only 19% of biomass is in 3LMNO
Recent Exploitation Level:	reduced in 1995 and 1996

that the catch level in 1999 could increase to about 30,000t, unless appropriate measures are implemented to improve conservation. At its September 1998 meeting, NAFO subsequently set the TAC at 33,000t; but with no changes in existing measures to improve conservation; which gave Canada a quota of 8,556t in 2+3K.

CHAPTER 4:

SCOTIAN SHELF AND BAY OF FUNDY GROUNDFISH STOCKS, REDFISH STOCKS AND GROUNDFISH STOCKS IN SUB-DIVISION 3PS

INTRODUCTION

This report is one in a series of reports that the Fisheries Resource Conservation Council (FRCC) makes to the Minister of Fisheries and Oceans on conservation measures for groundfish stocks in eastern Canada. This report deals with groundfish stocks on the Scotian Shelf and in the Bay of Fundy, redfish stocks in Units 1-3 and 3-0, and groundfish stocks in division 3Ps. This report makes recommendations for the 1999 fishery.

Every year the FRCC holds public consultations with stakeholders to gather information on all Atlantic groundfish stocks. This information assists us in forming our recommendations to the Minister of Fisheries and Oceans for annual conservation requirements for Atlantic groundfish. For this report we met with fishers and other concerned stakeholders in Harbour Breton, NF (November 16), Clarenville, NF (November 17), Sydney, NS (November 18), Halifax, NS (November 19), and Shelburne, NS (November 20). We also received a number of written briefs, which are noted in Appendix 3.

Although this report deals with groundfish stocks in NAFO division 3Ps, it does not include new recommendations for the 3Ps cod stock. Recommendations for the 1999 fishery for cod stocks in 3PS and 2J3KL, and all groundfish stocks in the Gulf of St. Lawrence will be included as part of a separate FRCC report to the Minister of Fisheries and Oceans in April 1999.

SPECIAL ZONAL ASSESSMENT

Again this year, the Department of Fisheries and Oceans (DFO) Science will be holding a special zonal assessment for the following cod stocks: 2J3KL, 3Ps, 4RS,3Pn, and 4TVn. This special assessment will be held during the first weeks of March 1999 in order to incorporate all available information into the assessment including the fall and winter surveys, and the results of this years sentinel and index fisheries. Until this special zonal assessment is held the FRCC will not be receiving advice from DFO Science on these cod stocks. It is important for everyone to have the results of the latest assessment before we consult on these stocks.

As a result of this change, the FRCC's will be holding groundfish consultations throughout the Gulf of St. Lawrence and in Newfoundland during the first weeks in April 1999.

Gulf Groundfish Stocks:	*April 7 - 9, 1999* *(to be confirmed)*
Cod Stocks (2J3KL and 3Ps):	*April 12 - 15, 1999* *(to be confirmed)*

3Ps COD – INTERIM QUOTA

The FRCC was reminded at our public consultations in Newfoundland and through written briefs to the Council, that delaying our advice to the Minister on 3Ps cod until the end of April would mean the fishery would probably not open until July. Many expressed frustrations over the difficulties this would cause.

In our report on conservation requirements for groundfish stocks in 1998, and in our report for conservation requirements for 1997, *Building the Bridge*, the FRCC recommended to the Minister that measures be taken to reasonably spread the effort for the 3Ps cod stock over the period of the fishing year to minimize impact on stock sub-components. Traditionally there has been both a winter and summer fishery in this area. However, given the timing of our advice last year and time required to agree on conservation harvesting plans, the winter/early spring fishery did not take place. The DFO stock assessment will not be ready until April 1999. The FRCC believes that an interim quota would be in order to allow the fishery to take place over the balance of the fishing year.

The FRCC notes that preliminary indications from the April 1998 DFO research vessel survey are positive and reports from the 1998 commercial fisheries are optimistic. Based on this, and with the goal of obtaining more information on the various sub-components of this stock, the FRCC is prepared to recommend to the Minister that an interim quota be established for 3Ps cod. This interim quota is to be based on our recommendations from 1998 and is to be established for the period January 1, 1999 to April 30, 1999 (the first third of the year). Catches during this period are to be counted against the 1999 quota once the FRCC has provided its recommendation to the Minister of Fisheries and Oceans and he has made his decision.

The FRCC cautions that fishing should not take place on spawning concentrations or during peak spawning periods. Also, it is important that proper conservation harvesting plans be in place at all times during this fishery. The FRCC is also concerned with the mixing of the 3Pn4RS cod stock on Burgeo Bank during the winter months and recommends that measures such as seasonal closures be put in place to minimize the potential impact on the 3Pn4RS cod stock. This is consistent with our recommendation for the 3Pn4RS cod stock in 1998.

> The FRCC recommends that:
>
> 1. an interim TAC of 6,700t be established for 3Ps cod from January 1, 1999 to April 30, 1999;
>
> 2. fishing on spawning con-

SEALS

As in previous years, we have included in our comments to the Minister our concern and alarm over the size and the effects of the grey seal herd on Sable Island. Recent reports on population put this herd at 200,000 animals. The Council believes that their consumption of juvenile cod and other species is a threat to the rebuilding of groundfish stocks, most especially cod in divisions 4Vn and 4VsW.

We are disappointed that the effect of seal consumption could not be quantified as part of the 1998 SSRs for Atlantic cod stocks. DFO analysis suggests that:

- grey seals are consuming between 5,400 - 22,000t annually of Eastern Scotian Shelf cod (on a total biomass estimated to be as low as 32,000t); and
- harp seals may be consuming as much as 140,000t annually of northern cod.
- Seals in the northern Gulf of St. Lawrence may have consumed as much as 68,000t of cod in 1996; and,
- Seals in the southern Gulf of St. Lawrence may be consuming over 10,000t annually of cod.

This speaks loudly for a call to action on this issue. Scientists, both within the Department and within the NAFO Scientific Council acknowledge the seriousness of this issue. Quantification of the effect of seal predation on the various stocks commercially exploited or forage species must be a very high priority.

In our 1998 Science Priorities Letter to the Minister of Fisheries and Oceans we recommend that:

> The effect of predation and of predator prey relationships be analyzed. The impact of seal consumption, especially, remains a major concern and work to quantify its impact must be pursued and funded. The potential effect of exploitation on forage species (e.g. capelin, herring, etc.) must be analyzed and quantified.

As part of our previous reports, the FRCC has recommended that we continue to move forward with developing new markets and products for seals. We are encouraged by progress that has been made at fully utilizing seals and we continue to recommend that immediate ways to significantly increase the harvest of all seals should be pursued. We have consistently expressed concern regarding the expanding herd of both grey seals and harp seals. **We have stated and continue to believe that seals present a significant threat to the recovery of (groundfish) stocks.**

The Council notes with dismay the apparent lack of progress in implementing measures to reduce either the harp or grey seal populations. A prevailing view among many associated with the Atlantic fishing industry is that the federal government's inaction on this matter reflects an abandonment of interests of the fishing industry and the groundfish resource in favour of potential political or trade considerations associated with the anticipated reaction of those who oppose action to reduce the seal population. The Council is not competent to comment on these views. However, in light of the urgency of the situation we feel that we must take every reasonable measure to communicate the need for immediate action to protect affected groundfish stocks.

The
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1998 Scotian Shelf and Bay of Fundy Stock Status Reports

The Council is alarmed by the changes in the outlook in the assessments of certain species. The Council was struck by the many comments made during public consultations that expressed shock and disbelief at the numbers and analysis contained in the Stock Status Reports (SSRs). Some fishers suggested that DFO Science has over-reacted and their assessments are now too cautious. It is interesting to note that most fishers quickly added to these comments saying that they appreciated the work DFO science had done in working with the fishermen.

This concern was most pronounced with respect to pollock where the F0.1 level fell from 24,000 t in the 1997 SSR, to 5,000 t in the 1998 SSR. The 1998 SSR presents a range for F0.1 from 5,000 t - 12,500 t and as the SSR states, "the population model is of very limited value for describing the recent population status." Many participants at our consultations suggested that environmental changes such as the intrusion of cold Labrador slope water (which could explain changes in distribution), the effect of restrictive management measures (which effect catch rates), and the semi-pelagic nature of pollock had not been factored into the scientific assessment. Given that this assessment is based on a CPUE index, most fishers believed that these factors could have had a substantial impact on the results.

There is an extraordinary degree of uncertainty about this stock and the Council has had to come to grips with how to treat this. We note that the shrinking geographic distribution of this stock and the absence of large fish in commercial catches are recurring themes and the Council considers these factors to be "warning signs". As a first step, we have heeded the warnings from DFO science and some fishers and recommended that this TAC be significantly lowered for the 1999 fishing season. We have not, however, recommended that the TAC be reduced to the lowest recommended level in the SSR. Given the extreme uncertainty about the abundance of this stock the FRCC has listened carefully to stakeholders and looked at other factors in addition to the SSR. We have noted that catches have remained stable for this stock throughout this decade at approximately 12,000t. The Council has also recommended that DFO Science take whatever action is necessary to investigate and implement alternate and/or additional methods of estimating abundance throughout the stock range to be used in future assessments of this stock.

Rebuilding Stocks to their Optimum Levels

When the Council made it's report to the Minister of Fisheries and Oceans for the 1998 fishing season it was confident that it had embarked on a rebuilding strategy for almost all groundfish stocks in this area. The Council was convinced that this was most certainly the case for 4X cod. The 1997 SSR had suggested two possible scenarios and the FRCC had adopted the more conservative approach.

We note with dismay that the outlook for this stock has continued to decline despite following an approach that should have promoted rebuilding. This year's SSR again offers two different scenarios for this stock and at both F0.1 levels the age 4+ biomass is expected to increase by 7,000 t. The Council has recommended a TAC of 7,000 t, which is slightly lower than F0.1 level of 7,500 t. We hope that we have adopted an approach that will promote rebuilding in this stock. We note that the sustainable harvest for this stock should be in the range of 20,000 t and we are committed to rebuilding this stock so we may reach this level.

As part of the FRCC mandate, the Council has as one of its conservation objectives "rebuilding stocks to their 'optimum' levels and thereafter maintaining them at or near those levels, subject to natural fluctuations, and with 'sufficient' spawning biomass to allow a continuing strong production of young fish." This is an objective the Council is eager to achieve. As many FRCC members have stated in the past, the western Scotian shelf and Bay of Fundy are some of the richest marine ecosystems areas in the northwest Atlantic. They have noted that this area has not been plagued with the extreme cold water temperatures that have effected the Newfoundland Shelf, the Gulf of St. Lawrence and the eastern Scotian shelf, nor has it had to battle a large and expanding seal population. In our reports, we have noted time and again that the industry continues to offer conservation minded presentations to the Council. The fishing industry in southwestern Nova Scotia works closely with DFO science. We note that the industry in this area began the first industry/DFO survey in an attempt to improve knowledge of their groundfish resources. With all of this, it suprising and puzzling that we have had not been able to rebuild fish stocks to "their optimum levels".

The FRCC notes that DFO has planned a workshop early in 1999 on managing the multi-species fishery in 4X. Given the sharp reductions in TAC's in 1999, the outcome of the workshop is critical for the management of these resources in the coming year.

The FRCC reiterates it commitment to rebuilding the groundfish stocks in this area back to their long-term levels. To do this, we must continue to look for reasons why this rebuilding is not occurring and this includes asking some tough questions and making even tougher recommendations.

- We remain concerned about the shift in fishing effort in this area to the mouth of the Bay of Fundy and we have again asked for the effects of this to be analyses.
- We remain concerned about the reports of dumping, discarding, unreporting, and misreporting and although we note that these reports are far less frequent than a few years ago, we are nevertheless concerned that the level of enforcement and monitoring must remain high.
- We support the continuation of closed areas and seasons to protect spawning and juvenile fish.
- We remind everyone that we have established a framework for achieving these goals and we released to the Minister of Fisheries and Oceans in July of 1997. The FRCC's *Groundfish Conservation Framework* should be adopted and implemented immediately.
- Perhaps most importantly, we will remain constant in our desire to control fishing effort to allow these stocks to rebuild.

EFFORT SHIFT TO THE MOUTH OF THE BAY OF FUNDY

As part of our 1998 report on *Conservation Requirements for Scotian Shelf and Bay of Fundy Groundfish Stocks*, the Council expressed its concern about the apparent shift in effort in division 4X to the mouth of the Bay of Fundy. We noted that a significant shift in effort has been a serious signal in other fisheries of stock collapse. For these reasons, the Council made a strong recommendation to the Minister of Fisheries and Oceans that DFO Management and Science be tasked to update data on the shift in effort from eastern 4X to western 4X for cod, haddock, pollock, white hake and redfish

We note that work took place over the past year to address many of the issues associated with this, however, some important questions still remain. We also note that some fishers have offered alternative explanations for this shift in effort that includes: by-catch restrictions, closed areas, and the cost of observer coverage that limit activity in the west.

1. The FRCC recommends that DFO Science undertake analyses to present al-

For the following Scotian Shelf and Bay of Fundy groundfish stocks the Council has made more specific recommendations to address the ongoing concerns associated with this issue: Unit 3 redfish, 4X cod, 4X haddock, 4VWX5Zc pollock, and 4VWX5Zc white hake.

2.

The FRCC recommends that DFO Science together with DFO Fisheries Management and industry provide data on the timing and locations of fishing patterns during the season for each gear in 4X since

REDFISH

Over the past two years in particular, the Council has heard and shared frustration over the collectivity of information received from the Redfish Stock Status reports. Concerns focus on apparent differences in stock assessment approaches between the management units. Based in part on the different gear used by the respective research vessels (i.e., the catchability factor), and on varying percentages of geographic coverage realized by the respective surveys, survey biomass estimates represent very different pictures in relation to the total biomass that may be present in the respective management units. This has resulted in a variation of observed exploitation rates (for TACs) ranging from 6% in Unit 2, to 10% in 30, to 15% in Unit 3. The F0.1 level is 10%.

Subjective comments from scientists indicate that the range of "real" exploitation rates is probably narrower than that represented by the stock status reports. Stock management for redfish in Atlantic Canada is therefore not only plagued by normal vagaries associated with stock research and assessment processes, there is little if any basis to conclude whether the recommended TAC levels are compatible with the intended target levels. This matter also appears to be complicated by reference to the F0.1 as a management approach. This yield per recruit approach to stock management may not be appropriate for redfish, which have highly intermittent recruitment patterns.

On the assumption there is consensus that these stocks should not be managed as pulse fisheries, that industry prefers to have a more stable approach to utilizing this resource, and in light of recruitment patterns, Atlantic redfish stock also appear to be candidates for management on the basis of a multi-year time-line (subject to annual reviews). For example, the existing biomass in Unit 2 appears to be the source of catches until the 1994 year class recruits to the fishery in the year 2004. In order to manage on a multi-year basis, or even to be secure in the knowledge that the suite of annually set TAC levels represent the intended approach to management of the respective redfish stocks, the Council believes that every effort must be made to establish reasonable goals, to calculate total or at least comparable biomass estimates for the management units, and to establish an appropriate exploitation rate(s) that balances recruitment pulses with stability objectives.

Last year, the FRCC recommended that, "DFO Science should seek to determine: a) the long-term potential for this stock (Unit 2) and b) the historical profile of exploitations rates." All relevant data on all redfish stocks should be consolidated as part of the following process, which the FRCC hereby recommends for 1999.

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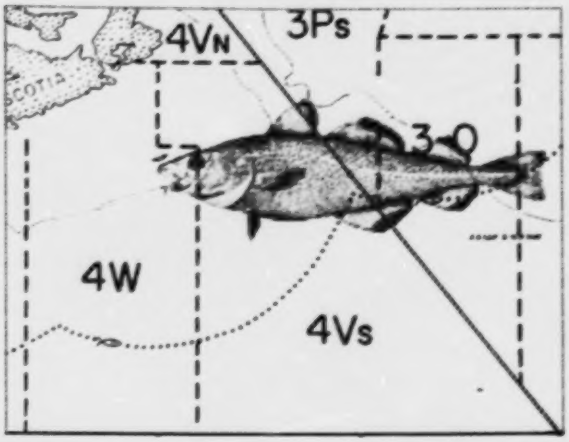
DRILLING FOR OIL AND GAS ON GEORGES BANK

During the Council's consultations in Halifax, NS and Shelburne, NS many participants raised the issue of drilling on Georges Bank for oil and gas. Canada and the United States of America established moratoria on drilling on Georges Bank 10 years ago and the USA has recently extended their moratorium until the year 2012. Fishers were anxious to see Canada do the same. Many participants spoke about the fragile nature of this area and the potential effects of any type of toxic discharge from drilling. One fisherman noted from a DFO document that shellfish and groundfish egg and larvae are present all year on Georges Bank, therefore there may be no "good time of year" for drilling. Others spoke about the need to be cautious with even disturbing the seabed in this area given the abundance of shellfish and crustaceans.

Many participants at our consultations told us that they had attended the information session from the large oil and gas companies and had asked questions concerning the safety of drilling in this type of sensitive ecosystem. They noted that the representatives from the oil and gas companies confessed to having never drilled in such a sensitive area as Georges Bank. One fishing representative stated that as far as he was concerned, the fishing industry would be taking all the risk for none of the gain.

One fisherman commented that the advances made in ocean drilling safety procedures over the past 10 years were great and if we wait for another 12 years to drill, these procedures will be even better. He noted that he had asked the companies if they would still be interested in drilling 12 years from now and they said, "yes". He concluded that it would be in everyone's best interest to wait at least until 2012 before anything went ahead.

COD - 4VSW



HISTORY OF FRCC RECOMMENDATIONS:

In August 1993, based on the drastic stock decline, the Council recommended that the 4VsW cod fishery be halted immediately. The fishery was closed in September. In November 1993, the Council recommended that there be no directed fishing for the 4VsW cod stock in 1994 and that by-catches be kept to the lowest possible level. Again in 1994, the Council recommended that there be no directed fishing for 4VsW cod in 1995 and that by-catches be kept to the lowest possible level. This recommendation was repeated in November 1995, October 1996 and November 1997 for the 1996, 1997 and 1998 fishing seasons. Consequently; the fishery has remained closed.

It was further recommended that no recreational or food fisheries take place in the area, given the very precarious state of the cod stock. The Council also recommended the immediate re-instatement of the March Research Vessel (RV) survey.

1998 CONSULTATIONS:

The FRCC held public consultations on this stock in Sydney, Nova Scotia (November 18), and Halifax, Nova Scotia (November 19). Industry representatives reported no new observations with respect to 4VsW cod.

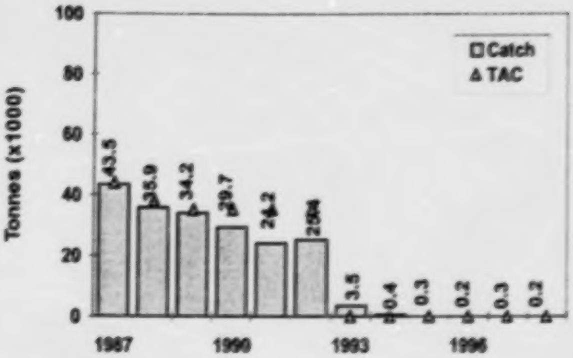
ANALYSIS:

The 1998 DFO Stock Status Report indicates that:

- Average weight at age has shown some improvement in the last few years from the historic minimum in 1992.
- Surveys indicate that, since the mid-1980s, there has been an increase in the mortality of cod, other than that attributable to fishing, and which has persisted even after the closure of the fishery.
- The scientific evidence indicates that the increase in mortality from sources other than reported landings including discarding, direct and indirect effects of harsh environmental conditions, and predation by seals.
- The spawning stock biomass is at or near the lowest level seen, between 5% to 16% of the average from 1979-89. Making plausible assumptions about seal consumption and other natural mortality, the biomass is projected to decline 5% to 20%, even in the absence of any fishery.
- There are inconsistent indicators of recent year-class strength, however, the weight of evidence suggests that recruitment has been poor.

RECOMMENDATIONS:

The FRCC recommends that:



* 1998 Catch: as of Oct.7/98

- The models of cod consumption by grey seals imply a range from 5,400t to 22,000t of cod being removed by seals. These are relative to estimated biomass of 32,000t to 37,000t respectively. It is not possible with the available data to choose among these models.

The assessment of Cod in 4VsW will be conducted at a zonal (Atlantic) meeting in March of 1999. Consequently, the Council may provide further recommendations on conservation measures for the management of 4VsW cod in 1999.

The FRCC notes that following our recommendation for the 1998 fishery, the March 1998 Research Vessel Survey has been reinstated and the fishing industry has funded this survey.

The FRCC is particularly concerned with two key issues that relate to this stock:

Environment: This area continues to have lower than normal water temperatures. Scientists report an increase in cold water species such as capelin in this area.

Investigations into the cause and significance of low condition in fish have suggested that low temperatures can induce poor condition and that reduced survivorship and reproductive success can result. This is also consistent with the appearance of colder waters on the eastern Scotian shelf since 1986.

Seals: The mean percentage of cod in the grey seal diet has remained at about 12%. Given that the grey seal population has apparently continued to increase at the same rate as previously measured, the estimate of consumption of 4VsW cod by grey seal is between 5,400 - 22,000t in 1997.

SENTINEL FISHERY:

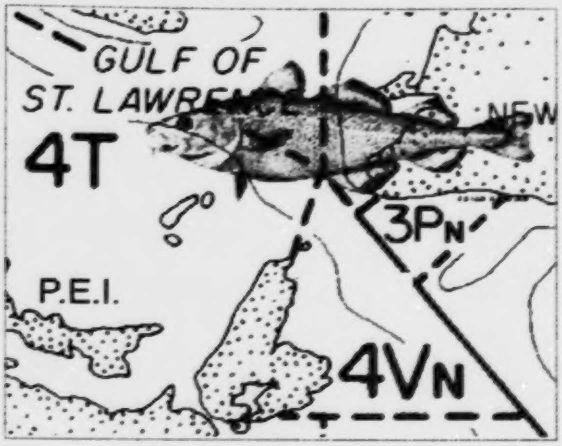
The distribution of catches in the surveys show most of the cod are found on the 4W banks (Western, Sable, Emerald) throughout the year. The Sentinel survey distribution also indicates that, at least during the fall, there are concentrations of cod in the nearshore areas.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator: low

Compared to average

COD - 4VN (M-O)



HISTORY OF FRCC RECOMMENDATIONS:

In August 1993, the Council recommended that fishing on this stock be halted immediately. The recommendation was accepted and the fishery was closed in September. In November 1993, the Council recommended that there be no directed fishing for this stock in 1994 and that by-catches be kept to the lowest possible level. This recommendation was repeated in November 1994 for the 1995 fishing year and again in November 1995 for the 1996 fishing season. These recommendations were accepted and the fishery has remained closed. In October 1996, the FRCC again recommended that there be no directed fishery for 4Vn Cod in 1997. Council also recommended that there be an expanded Sentinel Fishery with a strong commercial index component

For 1998, the Council repeated its recommendation that there be no directed fishery of this stock and that by-catches be kept to a minimum. It was also recommended that Sentinel Surveys continue for several years. Finally, the Council recommended that a workshop involving industry be held in 1998 to assess the Sentinel Survey in 4Vn and in particular to determine if the commercial index could be made viable and continued.

1998 CONSULTATIONS:

The FRCC held a consultation with stakeholders in Sydney, Nova Scotia, on November 18 to gather information on this stock. Although no one felt that this stock was healthy, or at mid-1980 levels, many commented that they were beginning to see signs of improvement for 4Vn cod.

ANALYSIS:

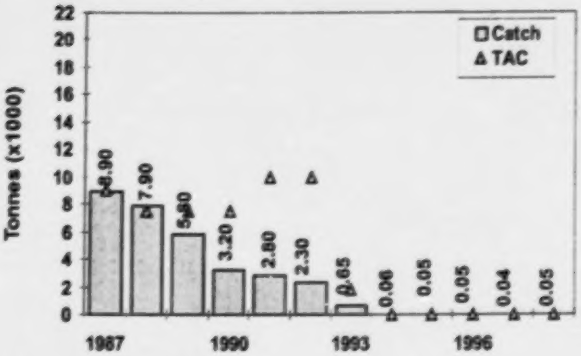
The 1998 Stock Status Report indicates that:

- A high level of stock mixing in the area confounds the assessment.
- Recruitment continues to be poor; the inshore survey indication of a good 1995 year class was not supported by research vessel results.
- Total mortality rates are still high despite the moratorium, suggesting emigration of fish out of the area, or a lack of survival.
- Catch rates in the sentinel survey have declined consistently from 1994 to 1996.
- Geographical distribution of cod (in sentinel fishery) has not changed over time.
- Total biomass and adult biomass remain very low; no recovery is possible in the short term.

The addition of information from the most recent vessel survey and results from the Sentinel fishery do not change the outlook for this resource.

RECOMMENDATIONS:

The FRCC recommends that:



*1998 Catch: as of Oct.07/98

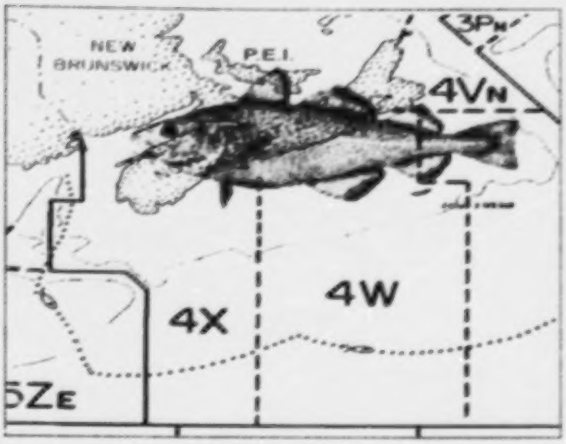
The Council remains concerned about the high levels of mortality associated with this stock, especially predation by grey seals. The mean percentage of cod in the grey seal diet has remained at about 12%. Given that the grey seal population has apparently continued to increase at the same rate as previously measured, the estimate of consumption of cod by grey seal is between 5,400 - 22,000t in 1997.

COUNCIL'S VIEWS ON STOCK STATUS:

Over-all indicator: very low levels

Compared to average

COD - 4X



HISTORY OF FRCC RECOMMENDATIONS:

In August 1993, the Council recommended, as a precautionary conservation measure, that the 1993 TAC be reduced from 26,000t to 15,000t. In November 1993, the Council recommended that the 1994 TAC for 4X cod be set at 13,000t. In addition, the Council recommended that other conservation measures, such as (a) improved selectivity of fishing gears (increased hook and mesh sizes), (b) limitations on the quantity and dimensions of fishing gear used, and (c) expanded use of area closures to protect spawning and/or juvenile aggregations, be considered for this fishery. In November 1994, the Council recommended that the 1995 TAC for 4X cod be set at 9,000t. As well, Council recommended that a workshop be organized jointly by the Department of Fisheries and Oceans and industry with the objective of an orderly fishery and the elimination of dumping, discarding and misreporting; and finally the Council recommended that should dumping, discarding and misreporting persist, the fishery be closed for the gear type involved. In the fall of 1995, the Council recommended a TAC of 11,000t for 1996 with mandatory dockside grading for all gear types.

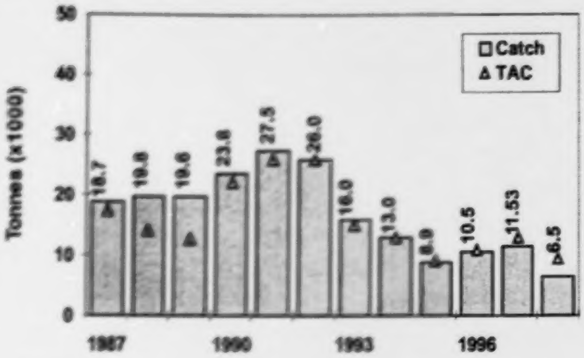
For 1997, the FRCC recommended that the TAC be set at 13,000t, mandatory dockside monitoring be maintained for all gear types, and, the dialogue between DFO and industry concerning dumping, discarding and misreporting continue, to ensure that management measures to avoid these problems remain in place.

For 1998, the Council recommended that the TAC for this stock be set at 9,300t, and as an immediate priority, DFO Management and Science be tasked to update data on the shift in effort from eastern 4X to western 4X (particularly to the inner Bay of Fundy) for cod, haddock and pollock. The Council further recom-

RECOMMENDATIONS:

The FRCC recommends that:

1. the 1999 TAC for 4X Cod be set at 7000t;
2. meas-



* 1998 Catch: as of Oct.7/98

mended that there be an update on genetic information on the Bay of Fundy and Scotian Shelf components of this stock with a view to determining if a geographic split in the stock between those two areas is appropriate.

1998 CONSULTATIONS:

The FRCC held public consultations on this stock in Halifax, Nova Scotia (November 19) and Shelburne, Nova Scotia (November 20). Many comments were received about 4X cod in both locations and, in addition, a number of written briefs commented on the state of this resource.

In Halifax, representatives from southern New Brunswick noted that a shift in effort to the mouth of the Bay of Fundy continues to be a problem for this stock. They also noted that the fixed gear sector is not catching their quota and this is usually a danger sign.

Briefs received from the industry in southwestern Nova Scotia called for the TAC to be set between 8,000t and 10,000t. At the consultation in Shelburne, industry representatives noted that the influx of colder Labrador slope water was having an effect on the distribution of cod. Some suggested that the SSR was overly cautious and that the Science branch had become very paranoid. It was also noted at the Shelburne meeting that the problem with effort shift to the mouth of the Bay of Fundy had been blown out of proportion and the shift had more to do with gear conflict and closed areas than with a change, or shrinking, of the resource.

ANALYSIS:

The 1998 Stock Status Report indicates that:

- Landings have declined throughout the 1990s, and will likely be the lowest on record in 1998.
- Biomass increase since 1993 is due primarily to the recruitment and growth of the 1992 year-class.
- Recruitment has been below average since 1992. The 1996 year-class, although below average, appears stronger than the three preceding it.
- There is considerable uncertainty in the estimates of recent stock abundance and exploitation levels.
- Exploitation rate has declined from the high of 60% in 1992, and is estimated to be between 22% and 29% in 1998.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall stock Indicator: likely below average

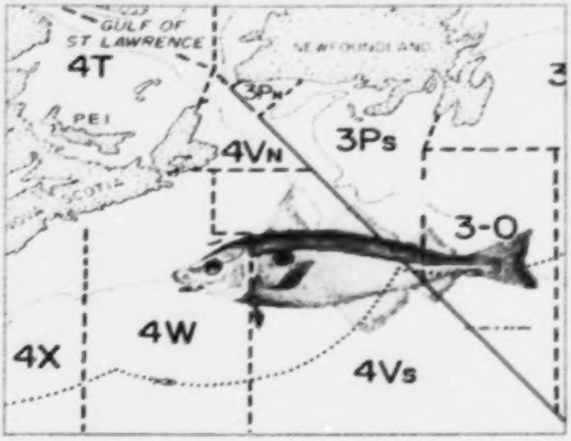
Compared to average

Spawning biomass: estimates uncertain but likely below average; reached minimum in

- Spawning stock biomass has increased from a minimum in 1994 to between 20,000 and 36,000t. This may still be at a level which has been associated with consistently poor recruitment in the past.
- Yield projections for 1999 at F_{01} are between 4,400t, and 7,500t.

For the range of estimated stock sizes, spawning stock biomass is expected to increase by 7,000t in the year 2000 at F_{01} yield levels.

HADDOCK - 4TVW



HISTORY OF FRCC RECOMMENDATIONS:

In August 1993, the Council expressed concern about the low level of this stock. In November 1993, the Council recommended that there be no directed fishing for the 4TVW haddock stock in 1994 and that the closure of the haddock box to all gears be continued. In 1994, the Council repeated this recommendation for 1995 and again for 1996. In October 1996, the FRCC again recommended that there be no directed fishing for 4TVW haddock in 1997 and the closure of the Haddock box to all gears be continued.

In November 1997, the Council re-iterated recommendations that there continue to be no directed fishing for 4TVW haddock in 1998 and that the closure of the haddock box to all gears be continued. The FRCC also recommended that the deterioration in the condition factor of 4TVW Haddock be monitored.

1998 CONSULTATIONS:

The FRCC held public consultations on this stock in Sydney, Nova Scotia (November 18) and Halifax, Nova Scotia (November 19). Industry participants noted that there have been better signs of haddock in this area, particularly in deeper water.

ANALYSIS:

The 1997 Stock Status Report indicates that:

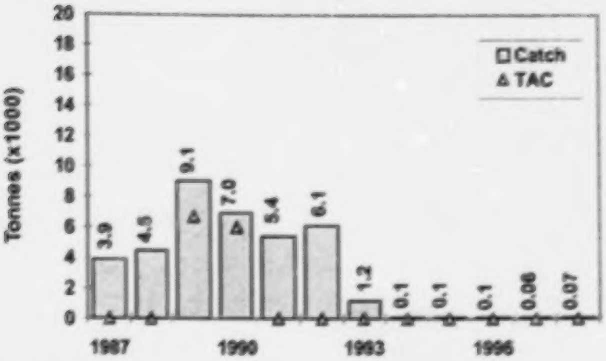
- Adult population biomass is low, and likely to decrease further.
- Recruitment has been below average in every year since the mid-80s (except 1988), but the 1993 and 1994 year classes may be almost up to average.
- The rate of natural mortality appears to be high on this stock.

This stock shows a high natural mortality in the range of 40%. Fishing alone has not caused the collapse. Harsh environmental conditions and, to a lesser extent, seals were factors contributing to this decline.

A reversal of poor ecological conditions is required before stock improvement is expected.

RECOMMENDATIONS:

The FRCC recommends that:



* 1998 Catch: as of Oct.7/98

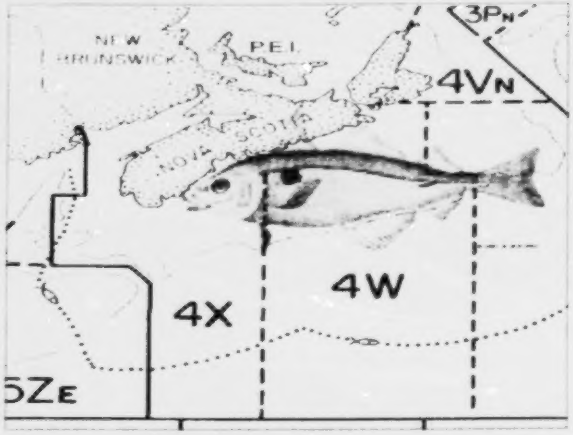
COUNCIL'S VIEWS ON STOCK STATUS:

Over-all Stock Indicator: very low (collapsed)

Compared to average

Spawning biomass: far below average (1/

HADDOCK - 4X



HISTORY OF FRCC RECOMMENDATIONS:

In its August 1993 report, the Council recommended that every action be taken to ensure that there are no overruns of the 1993 quota. The stock was closed to fishing in September because the quotas had been taken. In November 1993, the Council recommended that the 1994 TAC for 4X haddock be set at 4,500t (by-catch only) and that every action be taken to ensure that there are no overruns of this quota. In November 1994, the Council recommended that the 1995 TAC for 4X haddock be set at 6,000t. The Council recommended that, prior to the 1995 fishing season, a workshop be organized jointly by the Department of Fisheries and Oceans and the industry, with the objective of an orderly fishery, and the elimination of dumping, discarding and misreporting. Finally, the Council recommended that, should dumping, discarding and misreporting persist, the fishery be closed for the gear type involved. In November 1995, the Council recommended that the 1996 TAC for 4X Haddock be set at 6,500t, that mandatory dockside grading be implemented for all gear types and that the same closure procedure as recommended in 1995 be implemented for 1996.

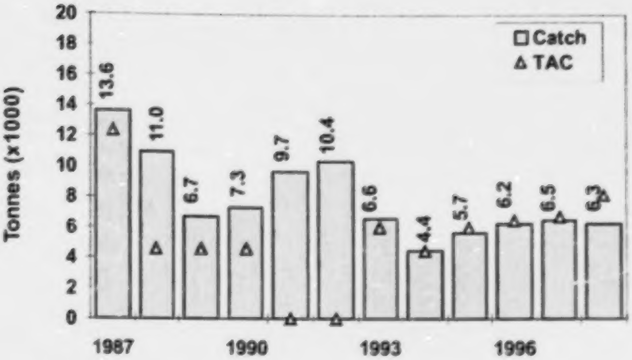
In October 1996, the FRCC recommended that the 1997 TAC be set at 6,700t and mandatory dockside monitoring be maintained for all gear types. The Council noted, as part of its recommendation, that should there be sufficient evidence of dumping, discarding and misreporting, the fishery be closed for the gear type involved until such time as fisheries managers can be assured that this activity will not continue; and fisheries managers take appropriate measures to ensure the protection of incoming year-

RECOMMENDATIONS:

The FRCC recommends that:

1. the 1999 TAC for 4X haddock be set at 8,100t;

2. the



* 1998 Catch: as of Oct.7/98

classes, including rigorously enforcing existing small fish protocols.

In November 1997, The Council recommended that the TAC for 4X Haddock be set at 8,100t. and as an immediate priority, DFO Management/Science be tasked to update data on the shift in effort from eastern 4X to western 4X (particularly to the inner Bay of Fundy) for cod, haddock and pollock. The Council also recommended that the decrease in condition factor be monitored.

1998 CONSULTATIONS:

The FRCC held public consultations on this stock in Halifax, Nova Scotia (November 19), and Shelburne, Nova Scotia (November 20). Additionally, many written briefs made comments on this stock. The majority of comments, both written and those made at public consultations, called for a conservative approach to 4X haddock and asked to keep the TAC around the 1998 level and below F_{01}. Some briefs noted that contrary to the 1998 Stock Status Report, there was a good distribution of haddock in the Scotian shelf.

ANALYSIS:

The 1998 Stock Status Report indicates that:

- Reported landings of 4X haddock increased from a low of 4,406t in 1994 to 6,527t in 1997. The stock unit was redefined in this assessment to include Canadian landings in unit area 4Xs and Division 5Y. Landings in the first half of 1998 were 3,597t.
- Both the 1993 and 1994 year-classes had been estimated to be high, but the retrospective pattern evident in the last three years infers the size of these year-classes to be lower.
- Exploitation rate for ages 5-7 decreased from approximately 50% in the early 1980s and dropped below the target in 1994 and 1995. Exploitation in 1998 will be about the target if the TAC is not exceeded.
- The projected yield at F_{01} in 1999 would be about 9,000t.
- If fished at F_{01}, the spawning stock biomass is projected to increase to 36,000t in 1999, and decrease subsequently.

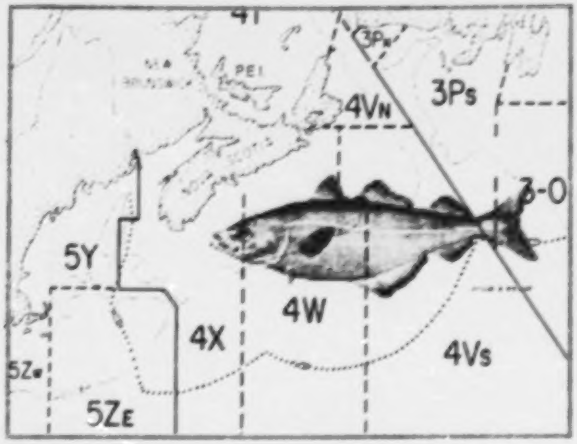
Council notes that maintaining the catch below the f0.1 level will aid in further building up of the biomass, to better achieve the catch potential of this stock.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator:

Compared to average

POLLOCK - 4VWX5Zc



HISTORY OF FRCC RECOMMENDATIONS:

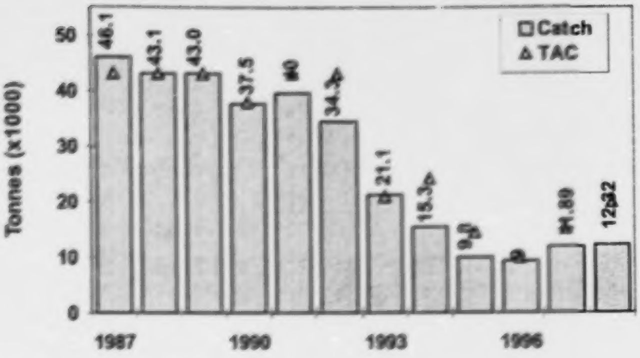
In August 1993, the Council recommended, as a precautionary conservation measure, that the 1993 TAC be reduced from 35,000t to 21,000t. The Council also noted that the closure of the 4VsW cod fishery could cause some redirection of effort to the pollock fishery. In November 1993, the Council recommended that the 1994 TAC for 4VWX5Zc pollock be set at 24,000t, the F0.1 catch level then calculated for 1994. In 1994, the Council recommended that the 1995 TAC for 4VWX5Zc pollock be set at the revised F0.1 calculation of 14,500t. The Council also recommended that Fisheries and Oceans scientists work with the industry to determine if, and during what times of the year, it would be appropriate to establish closed areas for 4VWX5Zc pollock to protect the spawning stock. The Council notes that the 2nd Groundfish Workshop held in early October 1995 provided a forum to discuss possible measures to further improve conservation of groundfish stocks in this area. In November 1995, the Council recommended that the 1996 TAC for 4VWX5Zc pollock be set at 10,000t.

In October 1996, the FRCC recommended that the 1997 TAC be increased to 15,000t. The Council cautioned that DFO scientists continue to work with the industry to determine if, and during what times of the year, it would be appropriate to establish closed

RECOMMENDATIONS:

The FRCC recommends that:

1. the 199 TAC for 4VWX5Zc pollock be set at 12,000t;
2. DFO Science together with



* 1998 Catch: as of Oct.7/98

areas for 4VWX5Zc pollock to protect the spawning stock. The Council also recommended that DFO scientists look at other abundance indicators.

In November 1997, the Council recommended that the 1998 TAC for 4VWX5c Pollock be set at 20,000t; and as an immediate priority, DFO Management/Science be tasked to update data on the shift in effort from eastern 4X to western 4X (particularly to the inner Bay of Fundy) for cod, haddock and pollock. The Council also recommended that the decline in condition factor be monitored.

1998 CONSULTATIONS:

The FRCC held public consultations on this stock in Sydney, Nova Scotia (November 18), Halifax, Nova Scotia (November 19), and Shelburne, Nova Scotia (November 20). In addition, the Council received a number of written briefs that commented on this stock. Almost all who commented on this stock expressed shock and disbelief at the numbers presented in the 1998 DFO Stock Status Report (SSR). Some representatives noted that the intrusion of cold Labrador slope water had an effect on the seasonal distribution of pollock but commented that pollock had returned in abundance later in the year. In Halifax, representatives from southern New Brunswick again cautioned the Council about the shift in effort to the mouth of the Bay of Fundy for this stock and for cod, haddock and redfish. In Shelburne, industry representatives commented that fish was dense at the mouth of the Bay of Fundy, and given management restrictions and closed areas, the mouth of the Bay was the only place left to fish.

Presentations and written briefs called for the TAC to be set around 12,500t, which is the upper F0.1 limit in the SSR. Some briefs called for the TAC to be as high as 16,000t but most advocated a more conservative approach. No one recommended a TAC lower than 12,500t.

ANALYSIS:

The 1998 Stock Status report indicates that:

- The 1998 fishery has been poor compared with 1997 in most areas, with exceptions including Georges Bank and some portions of western 4X.
- The geographic scope of the fishery has become increasingly constricted, with a growing proportion of landings coming from western 4X.
- The size and age of fish caught in the research vessel surveys and commercial fishery has diminished.
- The index of abundance, commercial fishery catch rates, has declined for the past two years.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall stock Indicator: likely much below average

Compared to average

Spawning biomass: uncertain but likely much below av-

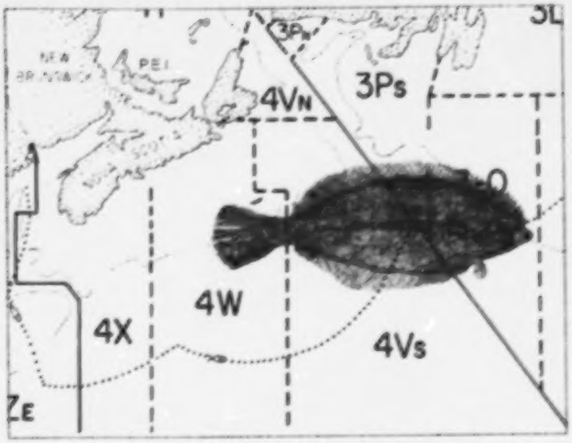
- There is considerable uncertainty in the recent estimates of exploitation rate and population size due to a retrospective pattern in the population model.
- The 1999 yield that reflects the average retrospective pattern in $F_{.1}$ catch calculated over the period 1997-1997 is about 5000t.
- Given the negative indicators for this resource, a rebuilding strategy is required.

The Council cannot overemphasize its distress over being confronted with stock status reports providing conclusions on F0.1 levels that have dropped from 24,000t to 5,000t within one year. On top of this, the most recent SSR presents two scenarios for F0.1 yields ranging from 5,000t to 12,500t, concluding "because of the problems described above, the population model is of very limited value for discerning the recent population status." In the face of industry observations there is a clear crises of confidence in the reliability of assessment methodologies employed in this fishery.

The stock status report states that the catch rate series is considered indicative of population trends in general. However, we are concerned that the schooling characteristics of this species makes it possible for catch rates to be maintained while the stock declines. Industry has noted that various negative impacts on CPUE, which has declined for the past two years, as well as the shift in area of effort, are related in part to restrictive management measures and to the influence of cold water temperatures. However, it is apparent that the shrinking geographic range of pollock landings, as an indicator of stock decline, is a recurring theme in groundfish stocks in this area.

There is an extraordinary degree of uncertainty about abundance of this stock. There will be some who will advocate that to err on the side of caution will mean that the 5,000t calculation would be adopted. There will be others who will point to the trend of standardized catch rates over the period 1991 through 1998 as being reasonably stable. TACs established through the same period (1991 through 1998) averaged 20,000t. The lowest TAC in this time series was 10,000t (1996).

FLATFISHES - 4VW



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council recommended that efforts underway to obtain better information on the landings by species and area be encouraged in order to provide a more rational basis for conservation measures for this resource complex in future years. The Council also recommended that, pending the provision of more reliable catch data on flatfish on the Scotian Shelf, the 1994 TAC for 4VWX flatfish be set at 14,000t. In November 1994, based upon available information, the Council concluded that both the effort and the TACs for these stocks needed to be reduced further and, as well, that the proportions between the two units should be changed to better reflect relative stock abundance. The Council recommended that the global 1995 TAC for all 4VWX flatfishes be set at 7,500t. In November 1995, the Council recommended that the 1996 TAC for 4VW flatfishes be set at 3,500t and that the 1996 TAC for 4X+5 flatfishes be set at 3,375t.

In October 1996, the FRCC recommended that the 1997 TAC for 4VW flatfishes be set at 3,000t and the 1997 TAC for 4X+5 flatfishes be set at 3,000t and that efforts to avoid the capture of small fish be continued for both of these fisheries. The Council also recommended that work be carried out by DFO and the industry, possibly in conjunction with the dockside monitoring program, to address the problem of species identification.

For 1998, the Council reiterated the previous years' recommendations and suggested that DFO and industry continue to work to address the problem of species identification.

1998 CONSULTATIONS:

The FRCC held public consultations on these stocks in Sydney (November 18) and Halifax, Nova Scotia (November 19). Industry representatives at the Sydney meeting commented that there is less effort on these stocks than in previous years and catch rates have been excellent.

ANALYSIS:

4VW Flatfish:

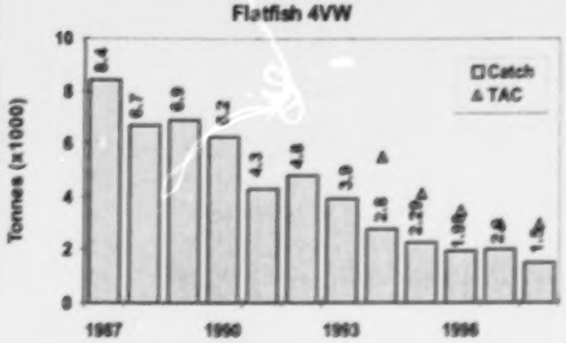
No new assessment in 1998, except for witch flounder, which has been assessed this year separately from other flatfish.

The 1997 Stock Status Report indicated that:

RECOMMENDATIONS:

The FRCC recommends that:

1. the



* 1998 Catch: as of Oct.7/98

- Biomass is in decline; resource status deteriorated in the last few years.
- Rebuilding unlikely unless catches kept below the 1996 level, and effort kept below those of recent years.
- Must avoid capture and discarding of small flatfish.
- Modest to good recruitment except for yellowtail.
- Winter flounder: abundance remains relatively high; not fished commercially in 4VW.
- Plaice: depleted and declining, fewer large fish than in the past, possible incoming recruitment.
- Yellowtail: depleted to a very low level, no incoming recruitment.

The 1997 Stock Status Report for Witch flounder indicates that:

- Fishable population declined from 1980s levels to low of 1992-93, remaining low at present.
- Pre-recruit (<35 cm) abundance (early-90s year classes) is now highest in 28-year series.
- Pre-recruits highly localized in Gully and deep holes north of Banquereau Bank in 4VW.
- Avoid increased effort on witch, to protect incoming recruitment and allow rebuilding.
- Likely some linkage with stocks to north and east.

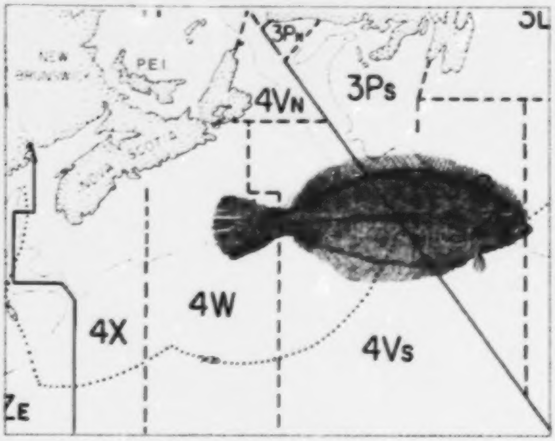
COUNCIL'S VIEWS ON STOCK STATUS (FLATFISH EXCEPT WITCH):

Over-all Stock Indicator: low (potential for rebuilding)

COUNCIL'S VIEWS ON STOCK STATUS (WITCH FLOUNDER):

Over-all Stock Indicator: low-Medium (re-building)

FLATFISHES - 4X



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council recommended that efforts underway to obtain better information on the landings by species and area be encouraged in order to provide a more rational basis for conservation measures for this resource complex in future years. The Council also recommended that, pending the provision of more reliable catch data on flatfish on the Scotian Shelf, the 1994 TAC for 4VWX flatfish be set at 14,000t. In November 1994, based upon available information, the Council concluded that both the effort and the TACs for these stocks needed to be reduced further and, as well, that the proportions between the two units should be changed to better reflect relative stock abundance. The Council recommended that the global 1995 TAC for all 4VWX flatfishes be set at 7,500t. In November 1995, the Council recommended that the 1996 TAC for 4VW flatfishes be set at 3,500t and that the 1996 TAC for 4X+5 flatfishes be set at 3,375t.

In October 1996, the FRCC recommended that the 1997 TAC for 4VW flatfishes be set at 3,000t and the 1997 TAC for 4X+5 flatfishes be set at 3,000t and that efforts to avoid the capture of small fish be continued for both of these fisheries. The Council also recommended that work be carried out by DFO and the industry, possibly in conjunction with the dockside monitoring program, to address the problem of species identification.

In November 1997, the Council recommended that the 1998 TAC for 4X flatfish be set at 2,000t, that the proportionate catch of Witch in 4X flatfish stocks not exceed current levels and that efforts to avoid the capture of small fish be continued. The Council also recommended that work by DFO and industry to address the problem of species identification continue.

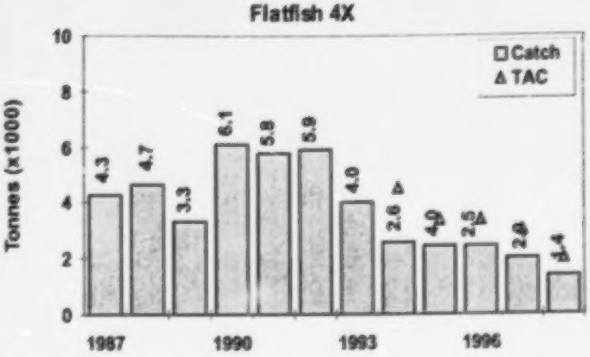
1998 CONSULTATIONS:

The FRCC held public consultations on these stocks in Halifax, Nova Scotia (November 19) and Shelburne, Nova Scotia (November 18). In Shelburne, industry representatives commented that a status quo approach would be good for these stocks as they appeared to be stable. Several of the written briefs received echoed these comments.

RECOMMENDATIONS:

The FRCC rec-om-mends that:

1. the 1999 TAC



* 1998 Catch: as of Oct.7/98

ANALYSIS

Witch flounder has been assessed separately from other flatfish.

The 1997 Stock Status Report indicates that:

- Given efficiency increases, declines in catch rates may under-estimate stock declines.
- The precautionary approach implies immediate action is needed to reduce fishing effort on 4X flatfish (could be done by lowering the TAC so landings in 1998 are less than those in 1996).
- Fishing effort should be spread proportionately among species.

Winter flounder:

- Some decline in <30cm fish; little change in >30cm fish, but decline in >40cm fish.
- Industry notes decline in abundance, which is consistent with decline in catch rates.

Plaice:

- Decline in <30cm fish since 1994, little change in >30cm fish, clear decline in >40cm fish.
- No significant new recruitment.
- Low commercial catch rates, consistent with industry view of declining abundance.

Yellowtail:

- Some increase in <30cm fish, possible increase in >30cm fish, decline in >40cm fish.
- No significant new recruitment.
- Industry notes declining abundance in keeping with lower CPUE.

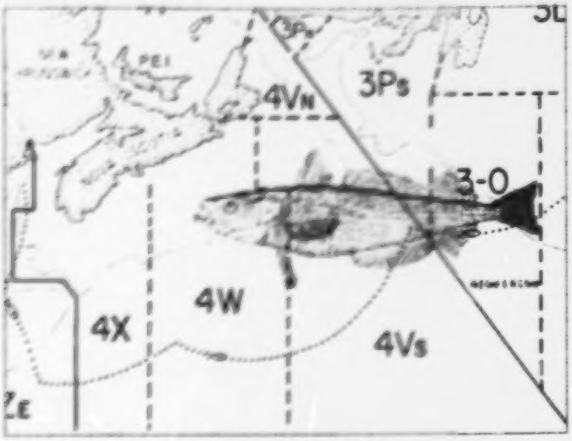
COUNCIL'S VIEWS ON STOCK STATUS (FLATFISH EXCEPT WITCH): over-all Stock Indicator: low-medium

COUNCIL'S VIEWS ON STOCK STATUS (WITCH FLOUNDER): over-all Stock Indicator: low, but rebuilding

Witch flounder:

- Fishable population declined from 1980s to low of 1992-93, still near lowest level observed.
- Pre-recruit (<35 cm) abundance (early-90s year classes) now highest in 28-year series.
- Small witch (<14 cm, probably 2-year-olds) remain at low abundance (in contrast to 4VW).
- Crucial to avoid increased effort on witch, to protect incoming recruitment and allow rebuilding.
- Likely some linkage with stocks to south and west.

SILVER HAKE - 4VWX



HISTORY OF FRCC RECOMMENDATIONS:

In June 1994, the NAFO Scientific Council calculated that the catch at F0.1 for 1995 would be 79,000t. However, they noted that this calculation could be overestimated by as much as 20,000t. The Council recommended that the 1995 TAC for 4VWX silver hake be set at 60,000t. In order to reduce by-catches, the Silver Hake Box was redrawn in 1994 to move its northern boundary into deeper waters. Mandatory use of the Nordmore grate was also imposed in 1994. In November 1995, the Council recommended that the 1996 TAC for 4VWX silver hake remain at 60,000t. In October 1996 the FRCC recommended that the 1997 TAC for 4VWX silver hake be reduced to 50,000t.

For 1998, the Council recommended that the 1998 TAC for 4VWX Silver Hake be set at 55,000t. The Council also recommended that the by-catch of groundfish continue to be monitored to ensure that there be no adverse impact on these resources, and the decrease in condition factor be monitored.

1998 CONSULTATIONS:

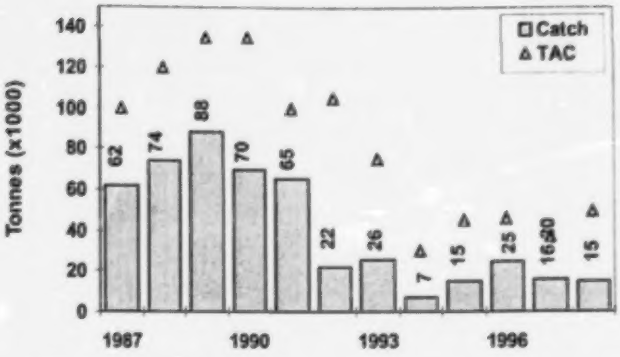
The FRCC held public consultations on this stock in Sydney, NS (November 18), Halifax, NS (November 19) and Shelburne, NS (November 20). Many comments were received about silver hake in each location. In addition, a number of written briefs commented on the state of this resource.

In Sydney, industry participants called on the Council to keep the TAC around the f0.1 level or at most a 25% cut from last year. They also questioned the effect of colder than normal water on the recruitment in this stock. In Halifax, representatives called for the quota to be set at 30,000t. Many questioned the findings in the DFO SSR and noted that the pre-recruit data is missing. One representative stated bluntly that he did not believe that the industry was landing as many 2-year-old fish as the SSR suggested. In Shelburne, industry representatives reminded the Council that this fishery has only just begun to be prosecuted by Canadians. Some suggested that there has been a problem with the Nordmore grate excluding larger fish and this has given the catch an odd composition of year classes.

RECOMMENDATIONS:

The FRCC recommends that:

1. the 1999 TAC for 4VWX Silver Hake



* 1998 Catch: as of Oct.7/98

The representative from the Silver Hake Advisory Committee called for a TAC of 30,000t and noted that uncertainties in the assessment may have been caused by environmental changes.

ANALYSIS:

The 1998 Stock Status Report indicates that:

- Canadian catches of Scotian Shelf silver hake are rising, and exceed foreign catches for the first time in 1998.
- There is a long-term declining trend in survey mean weights-at-age from 1970through to the early 1990's Weights-at-age have since recovered, slightly, but remain low.
- The most recent survey estimates of abundance and biomass show a decline.
- The cold temperatures observed on the Scotian Shelf in 1997-8 may reduce recruitment.
- The 1996 year-class is above average in size, while the 1997 year-class appears to be below average.

COUNCIL'S VIEWS ON STOCK STATUS:

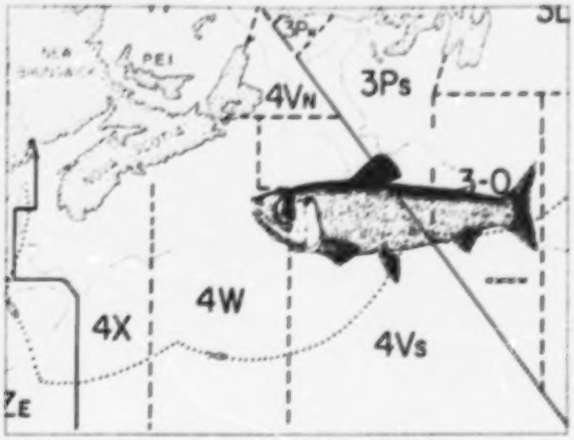
Over-all stock Indicator: average

Compared to average

Spawning biomass: likely average

Total Biomass: likely average

ARGENTINE - 4VWX



HISTORY OF FRCC RECOMMENDATIONS:

Catches from this stock, which are taken as by-catch in the silver hake fishery, have not exceeded 360t since 1983. In November 1993, the Council recommended that, as a precautionary measure, the 1994 TAC for argentine in 4VWX be set at 1,000t. The TAC was set at that level for 1994. In 1994, the Council recommended that the 1995 TAC for 4VWX argentine be set at 1,000t and this recommendation was repeated for 1996, 1997 and 1998.

The Council further recommended in 1998 that if this fishery is pursued in a commercial fashion, there be a requirement for a scientifically based data collection component to improve knowledge about the resource.

1998 CONSULTATIONS:

No comments were received about this stock.

ANALYSIS:

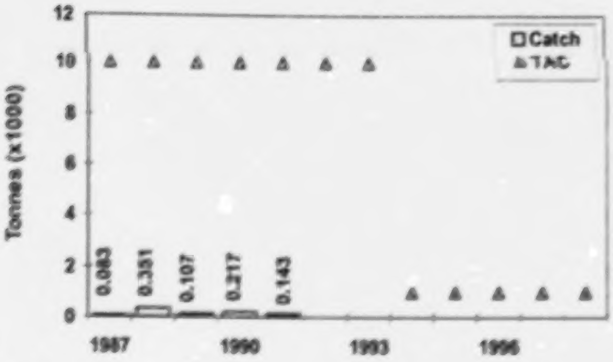
Since no assessment of this stock was done in 1998, a new stock status report was not produced. Scientific information is from the 1996 Stock Status Report.

The 1996 DFO Stock Status Report indicates that there is too little known about this stock component to generate sufficient data for analytical purposes. Given the by-catch nature of this fishery and the low catches in recent years, the Council believes that the 1999 TAC can continue to be set at 1,000t, as a precautionary measure.

RECOMMENDATIONS:

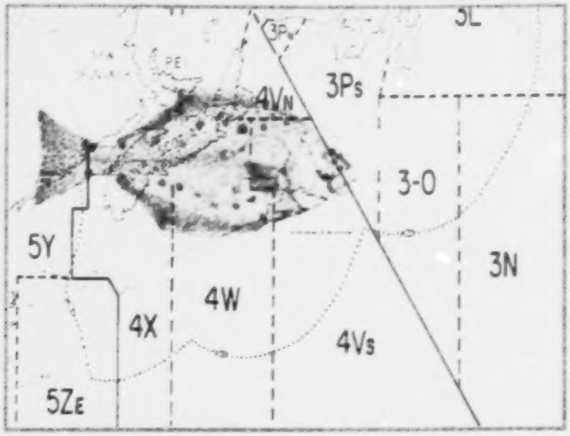
The FRCC recommends that:

1. the



* 1998 Catch: as of Oct.7/98

ATLANTIC HALIBUT - 3NOPs4VWX5Zc



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council recommended that the 1994 TAC for 3NOPs4VWX5Zc Atlantic halibut be set at 1,500t as a precautionary measure. The Council also recommended that the mandatory landing provisions be reviewed with the aim of allowing halibut smaller than 81 cm (32 inches) to be released. This was implemented in 1994 and remains a critical component of the FRCC recommendation for this stock. In 1994, the Council recommended that the 1995 TAC for 3NOPs4VWX5Zc Atlantic halibut be set at 850t as a precautionary measure. The Council recommended also that mandatory landing provisions be reviewed regarding the discarding of incidental catches of halibut smaller than 32 inches. In November 1995, the Council recommended that the 1996 TAC for Atlantic halibut remain at 850t with the same small halibut release provision.

In October 1996, the FRCC recommended that the 1997 TAC for 3NOPs4VWX5Zc Atlantic halibut be set at 850t, and that the provision for the release of halibut smaller than 81cm be maintained. In addition to this recommendation the Council asked that a joint DFO/industry study be conducted to assist in the overall assessment process, such as appropriate biological sampling, a tagging/movement component, identification of stock sub-components and identification of alternative survey indices. The Council reiterated these recommendations for 1998.

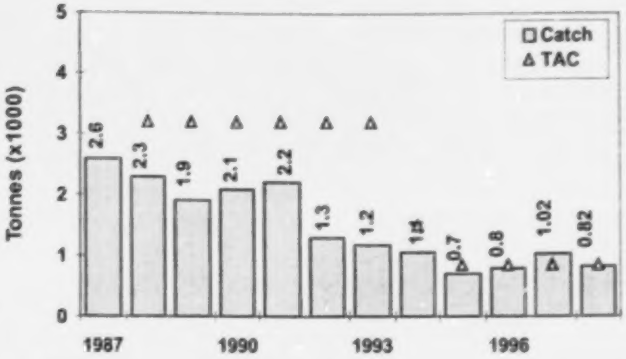
1998 CONSULTATIONS:

The FRCC held public consultations on this stock in Harbour Breton, Newfoundland (November 16), Clarenville, Newfoundland (November 17), Sydney, Nova Scotia (November 18), Halifax, Nova Scotia (November 19), and Shelburne, Nova Scotia (November 20). Most participants in Shelbrune and Halifax called for the status quo, however, there were many reported conflicts over allocations. In Newfoundland and Sydney some industry representatives called for an increase in the quota. Many participants, especially in Nova Scotia, reported good signs of juvenile halibut.

RECOMMENDATIONS:

The FRCC recommends that:

1. the 1999 TAC



* 1998 Catch: as of Oct.7/98

ANALYSIS:

The 1997 Stock Status Report indicates that:

- Abundance is low compared to past years; declines have been more evident for southern Grand Banks than Scotian Shelf.
- Total mortality (fishing and natural) seems to have increased.
- There is a reduced range of sizes in the population.
- Halibut-directed CPUE down since 1988; some indications of increase in 1996.
- "Present restrictive measures should be continued."

The FRCC noted in November 1997, that the stock status report and the information from fishermen are diametrically opposed for this stock. The former paints a picture of a very depleted stock, while the latter indicates a healthier and growing stock. Using a precautionary approach, it would not be prudent to increase the commercial TAC at this point, but it is important for a scientifically-designed fishermen-operated survey/index fishery to commence, to deal with the great uncertainty in the status of this resource.

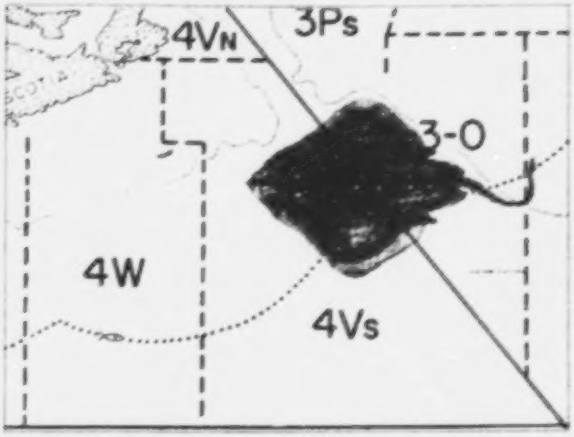
The FRCC is pleased to note that following our November 1997 recommendation, the fishing industry and DFO science have designed and implemented a survey program for Atlantic Halibut. We congratulate them for their efforts and we look forward to having the additional information this survey will provide.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator: low

Compared to average

SKATES - 4VsW



HISTORY OF FRCC RECOMMENDATIONS:

In 1994, a combination of closures of traditional groundfish fisheries on the Scotian Shelf and openings in the markets for skate wings resulted in the development of a directed Canadian skate fishery.In 1994, a preliminary TAC of 1,200t was established with an additional 800t allocated to joint industry/science surveys. The 1994 catch accounted for 3,100mt, including by-catch in non-directed fisheries. The 1995 directed fishery was regulated by 1,600t TAC, with an additional 20% by-catch allowed in the directed flatfish fishery. In 1996, the TAC was lowered to 1200t, with an additional 20% by-catch allowed in the directed flatfish fishery. In October 1996, the FRCC recommended that the 1997 TAC for 4VsW skates be again set at 1,200t, including by-catch and measures be implemented to diversify size and species of skate in the catch.

For 1998, the FRCC repeated its recommendations that the 1998 TAC for 4VsW skates be set at 1,200t, including by-catch and that measures be implemented to diversify size and species of skate in the catch. The Council also recommended that the experimental fishery continue at a similar level of fishing effort in 1997.

1998 CONSULTATIONS:

The FRCC held public consultations on this stock in Sydney, Nova Scotia (November 18) and Halifax, Nova Scotia (November 19). In Sydney, industry representatives noted that the quota should be reduced and many expressed concerns about catching too many older fish.

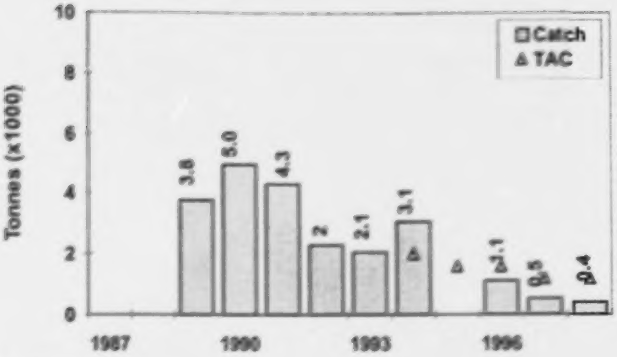
ANALYSIS:

The 1998 Stock Status Report indicates that:

- Landings in the directed fishery have ranged from 2152t in 1994 to less than 1000t in 1998, while by-catch estimates have declined from greater than 2100t in 1990to less than 100t in 1997.
- Commercial catch rates have remained steady since 1994.
- Removals from the fishery peak between 70to 75cm. There has been a progressive reduction in winter skate greater than 90cm since 1995. Female winter skate mature at 75cm.
- Overall survey abundance in Div. 4VsW are at very low levels, while the slope strata indices in Div. 4VsW have increased.
- Total mortalities have doubled since 1995.
- Current harvest levels in the 'developing' fishery are not sustainable.

RECOMMENDATIONS:

The FRCC recommends that:

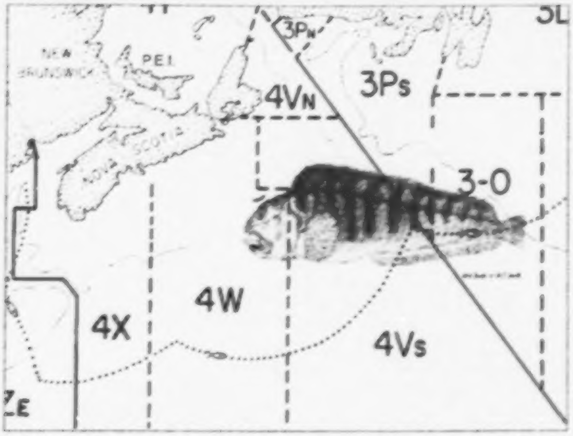


* 1998 Catch: as of Oct.7/98

COUNCIL'S VIEWS ON STOCK STATUS:

Over-all Stock Indicator:

WOLFFISH - 4VWX



HISTORY OF FRCC RECOMMENDATIONS:

With the limited information available in 1995 on which to base a firm recommendation, the Council recommended a precautionary TAC for 1996 at 600t.

In both 1997 and 1998, the FRCC recommended that catches should be limited to the historical levels consistent with the truly by-catch nature of this fishery, with sufficient flexibility to avoid closing traditional directed groundfish fisheries.

1998 CONSULTATIONS:

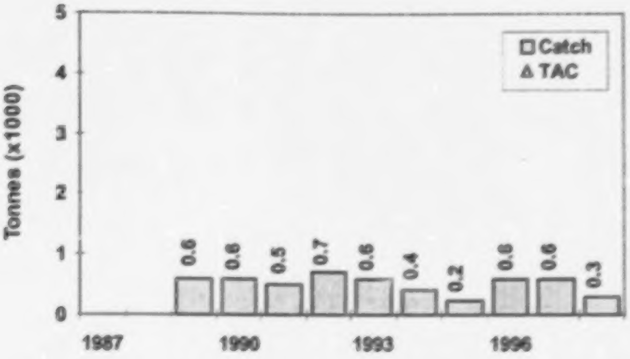
The FRCC held public consultations on this stock in Sydney, Nova Scotia (November 18), Halifax, Nova Scotia (November 19), and Shelburne, Nova Scotia (November 20). In Shelburne some industry representatives noted that the status quo was preferred for this stock.

ANALYSIS:

Since no assessment of this stock was done in 1998, a new stock status report was not produced. Scientific information here is from the 1996 Stock Status Report.

It appears that the concentrated fishing effort in 4X on this species, has likely contributed to overall decline. As well, scientists believe that catches in excess of 600t in 1997 would not likely be sustainable.

RECOMMENDATION



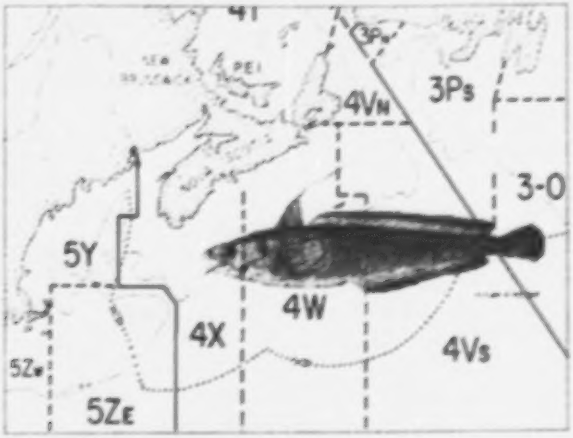
* 1998 Catch: as of Nov. 28/98

COUNCIL'S VIEWS ON STOCK STATUS:

Over-all Stock Indicator: low

Compared to average

WHITE HAKE - 4VWX5Zc



HISTORY OF FRCC RECOMMENDATIONS:

In November 1995, the Council recommended that the 1996 TAC for 4VWX white hake be set at 2,500t.

In October 1996, the FRCC recommended that the 1997 TAC for 4VWX+5Zc white hake be increased to 3,500t with flexibility to avoid closing traditional directed groundfish fisheries. The Council added that, for assessment purposes, separation of management units 4VW and 4X+5Zc should be implemented and, given the belief that the western stock (4X+5Zc) is transboundary, this stock be included in the bilateral consultations on groundfish with the U.S. with the objective of developing a joint management strategy.

For 1998, the FRCC re-iterated its 1997 recommendations and further recommended that as an immediate priority, DFO Management/Science be tasked to update data on the shift in effort from eastern 4X to western 4X (particularly to the inner Bay of Fundy). If the result of this review indicates potential adverse effect on local aggregations or spawning components, measures should be put in place to protect this resource.

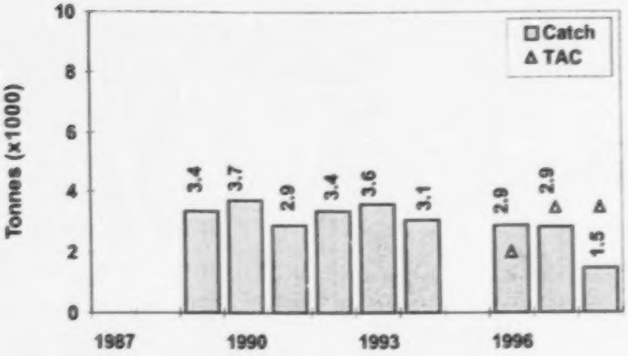
1998 CONSULTATIONS

The FRCC held public consultations on this stock in Sydney, Nova Scotia (November 18), Halifax, Nova Scotia (November 19), and Shelburne, Nova Scotia (November 20). Additionally, a number of the written briefs the Council received made comments on this stock. In Sydney industry representatives noted the catch rates were up in the past few years but all called

RECOMMENDATIONS:

The FRCC recommends that:

1. there be no directed fishery for white hake in 4VWX5Zc



* 1998 Catch: as of Oct.7/98

for more information on this stock. In Halifax and Shelburne most asked for the status quo for this stock and noted that there were few directed catches from any gear sector. Some written briefs noted that cold water had an influence on white hake while others called for the development of a closed spawning area.

ANALYSIS:

The 1998 Stock Status Report indicates that:

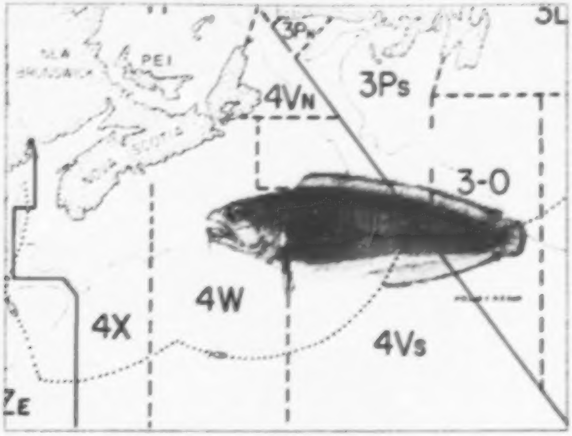
- Total landings have declined since 1995, and landings to date suggest that 1998 may prove the lowest in three decades.
- Commercial catch rates have declined since 1996 for all major fleets (longliners, gillnetters, trawlers), with 1998 demonstrating the lowest catch rates ever seen for all three fleets.
- Research vessel survey abundance estimates from Canadian (summer 4VWX, spring 4VsW, spring Georges Bank) and US (spring and fall offshore) sources are all near record lows.
- The size composition of the summer research vessel survey catches in 4X has been getting smaller since 1995, and mean weights of individual fish in 4VWX surveys have been declining since 1984.
- Mortality rates for 4X white hake derived from summer research vessel survey data depict exploitation at or above 50% throughout the 1990's
- There should be no directed fishery for white hake.

COUNCIL'S VIEWS ON STOCK STATUS:

Over-all stock Indicator: very low

Compared to average

CUSK - 4VWX



HISTORY OF FRCC RECOMMENDATIONS:

In November 1995, the Council recommended that the 1996 TAC for 4VWX cusk be set at 1500t.

In October 1996, the FRCC recommended that the 1997 TAC for 4VWX cusk should not exceed historical catch levels, with sufficient flexibility to avoid closing traditional directed groundfish fisheries. This recommendation was repeated for 1998.

1998 CONSULTATIONS

No comments were received on this stock during public consultations.

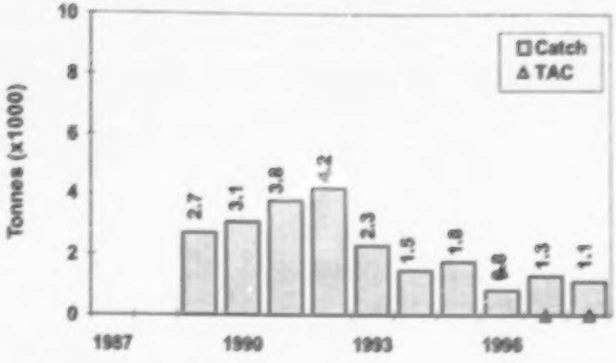
ANALYSIS:

The 1998 Stock Status Report indicates that:

- Landings in 1997 were 1642t, landings have remained below the long-term mean of 3469t since 1993.
- Research vessel survey mean weight per tow declined abruptly in 1992 and has remained below the long-term mean of 1.29 kg since that time. The 1998 value is the lowest in the survey history.
- Research vessel survey catches has shown a restriction of distribution to the western portion of 4X with very few cusk caught in 4 W.
- Future catches should be substantially reduced and measures should be undertaken to conserve and rebuild the cusk stock.

RECOMMENDATIONS:

The FRCC recommends that:



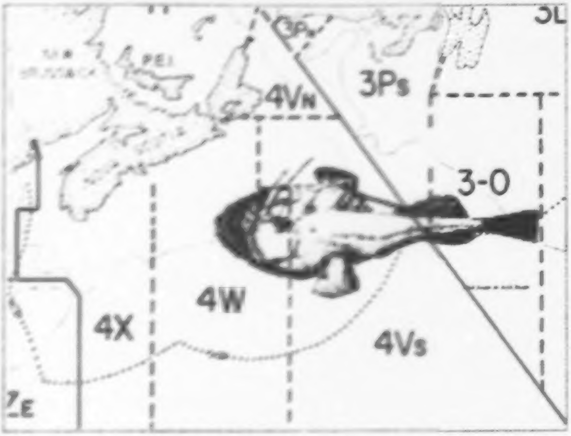
* 1998 Catch: as of Oct.7/98

COUNCIL'S VIEWS ON STOCK STATUS:

Over-all Stock Indicator: low

Compared to average

MONKFISH - 4VWX



HISTORY OF FRCC RECOMMENDATIONS:

In November 1995, the Council recommended that the 1996 TAC for 4VWX monkfish be set at 700t.

For both 1997 and 1998, the FRCC recommended that the TAC for 4VWX monkfish should not exceed historical levels, with sufficient flexibility to avoid closing traditional direct groundfish fisheries. The Council also recommended that monkfish be treated as a by-catch in all other fisheries and the joint industry/DFO science five year program should be continued.

1998 CONSULTATIONS:

The FRCC held public consultations on this stock in Sydney, Nova Scotia (November 18), Halifax, Nova Scotia (November 19), and Shelburne, Nova Scotia (November 20). In Shelburne, some industry representatives suggested this be a by-catch only fishery.

ANALYSIS:

Since no assessment of this stock was done in 1998, a new stock status report was not produced. Scientific information here is from the 1996 Stock Status Report.

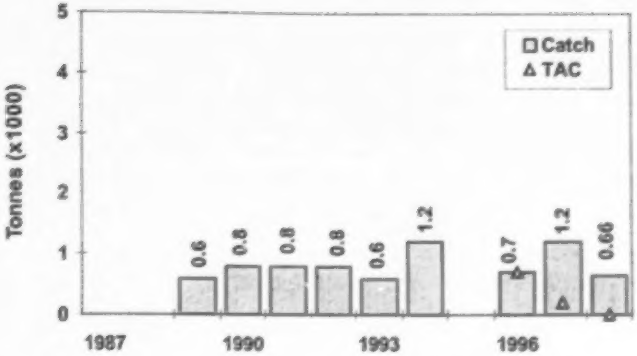
Historically, monkfish have been almost exclusively a by-catch fishing of groundfish and scallops ventures. Between 1992 and 1994, the less than 65 ft. mobile fleet has been directing for monkfish in 4X. Consequently landings in this area increased from just over 300t in 1991 to 1,100t in 1994. Abundance is highest in central Scotian Shelf and in the inshore areas of west of 4W. This is a shared resource with the U.S. where the fishery is essentially unregulated. The U.S. survey shows the resource is over exploited. There is no evidence of large scale migration of this stock and there appears to be discrete spawning components in Canadian waters. Consequently, the stock may be managed successfully by Canada with 5Zc included in the management area.

There is a joint industry/science five year program to improve knowledge of the resource being conducted by five mobile gear vessels less than 65 feet. They are conducting a directed fishery in Georges Basin for 200t in co-operation with DFO. There is no biological basis to date for establishing a TAC. DFO Science recommends that catches be maintained at a low level and that the five-year research program be continued.

Scientists suggested that catches be limited to less than 800t, the average landing since 1988. The 1996 Stock Status Report confirms that the biomass remains low and catch level in the order of 800t continue to be suggested.

RECOMMENDATIONS:

The FRCC recommends that:



* 1998 Catch: as of Oct.7/98

COUNCIL'S VIEWS ON STOCK STATUS:

Over-all Stock Indicator: below average

Compared to average

REDFISH

Over the past two years in particular, the Council has heard and shared frustration over the collectivity of information received from the Redfish Stock Status reports. Concerns focus on apparent differences in stock assessment approaches between the management units. Based in part on the different gear used by the respective research vessels (i.e., the catchability factor), and on varying percentages of geographic coverage realized by the respective surveys, survey biomass estimates represent very different pictures in relation to the total biomass that may be present in the respective management units. This has resulted in a variation of observed exploitation rates (for TACs) ranging from 6% in Unit 2, to 10% in 30, to 15% in Unit 3. The F0.1 level is 10%.

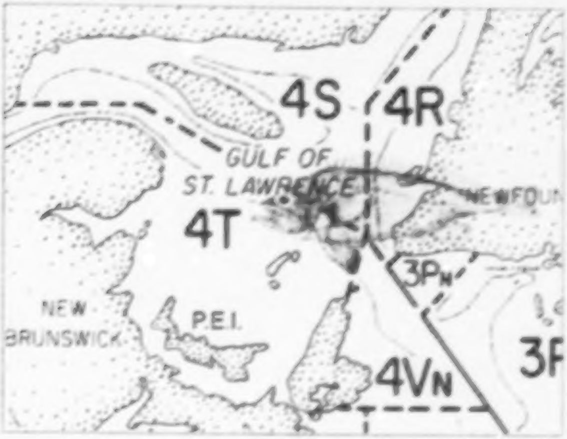
Subjective comments from scientists indicate that the range of "real" exploitation rates is probably narrower than that represented by the stock status reports. Stock management for redfish in Atlantic Canada is therefore not only plagued by normal vagaries associated with stock research and assessment processes, there is little if any basis to conclude whether the recommended TAC levels are compatible with the intended target levels. This matter also appears to be complicated by reference to the F0.1 as a management approach. This yield per recruit approach to stock management may not be appropriate for redfish, which have highly intermittent recruitment patterns.

On the assumption there is consensus that these stocks should not be managed as pulse fisheries, that industry prefers to have a more stable approach to utilizing this resource, and in light of recruitment patterns, Atlantic redfish stock also appear to be candidates for management on the basis of a multi-year time-line (subject to annual reviews). For example, the existing biomass in Unit 2 appears to be the source of catches until the 1994 year class recruits to the fishery in the year 2004. In order to manage on a multi-year basis, or even to be secure in the knowledge that the suite of annually set TAC levels represent the intended approach to management of the respective redfish stocks, the Council believes that every effort must be made to establish reasonable goals, to calculate total or at least comparable biomass estimates for the management units, and to establish an appropriate exploitation rate(s) that balances recruitment pulses with stability objectives.

Last year, the FRCC recommended that, "DFO Science should seek to determine: a) the long-term potential for this stock (Unit 2) and b) the historical profile of exploitations rates." All relevant data on all redfish stocks should be consolidated as part of the following process, which the FRCC hereby recommends for 1999.

1. A Working Group led by DFO Management, and including industry, the FRCC and DFO Science Branch should be struck to develop a recommended management approach for

REDFISH UNIT 1 - 4RST + 3PN (JAN-MAY) + 4VN (JAN-MAY)



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council expressed its concern about this stock and recommended that the 1994 TAC be set at 30,000t (a 50% reduction) with the view to keeping it at this level for the following two years, if at all possible, to achieve stability.

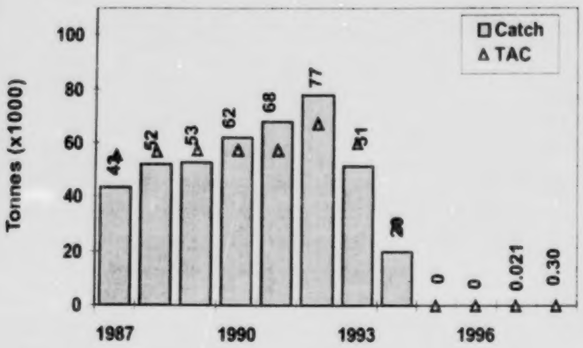
In its 1994 report, the Council recommended, for Unit 1 redfish, that current scientific work be strengthened and elaborated in co-operation with the industry so as to clarify redfish management units, as well as to better understand migration patterns and stock status and that the 1995 TAC be set at 7,500t. As well, the Council recommended that a small fish protocol be established to protect juvenile redfish; and that Fisheries and Oceans, in consultation with industry stakeholders, limit the fishery as much as practical during the January to June period. The Minister considered the FRCC TAC recommendation but concluded that no fishery for Unit 1 redfish should occur in 1995. Further to the Council's recommendation for a joint industry/science initiative for redfish, a multi-disciplinary research program was developed jointly with industry stakeholders and DFO in an attempt to address key questions related to redfish biology, stock definition and migrations, and stock status. For 1996, and again in 1997, the FRCC recommended continuing the moratorium and minimizing the by-catch of redfish in other fisheries. In 1997, the FRCC also recommended that cooperative industry science surveys take place.

For 1998, the Council once again recommended that no directed commercial fishery take place. The FRCC further recommended that a joint industry science sentinel survey be established, on an ongoing basis, to include both a fully scientific component and a component to re-establish the commercial catch rate index. It was recommended that catches for this program not exceed 1,000t.

RECOMMENDATIONS:

The FRCC recommends that:

1. no directed commercial fishery



* 1998 Catch: as of Oct.07/98

1998 CONSULTATIONS:

Consultations to receive comment on redfish stocks were held in November, 1998. In Harbour Breton, NF, inshore industry representatives explained that redfish distribution was increasing and that the mobile gear sentinel survey in the northern and central Gulf was picking up redfish routinely. They advocated that the industry survey program n Unit 1 should be expanded to include other fleets. In Halifax, at an Atlantic-wide consultation on redfish, participants called for the industry survey program to be maintained and strengthened, and identified a critical need for more information with regard to the status of this stock.

ANALYSIS:

The 1998 DFO Stock Status Report indicates:

- No sign of strong incoming recruitment.
- Biomass at very low levels.
- Recovery can only occur 7-9 years after significant recruitment has occurred.

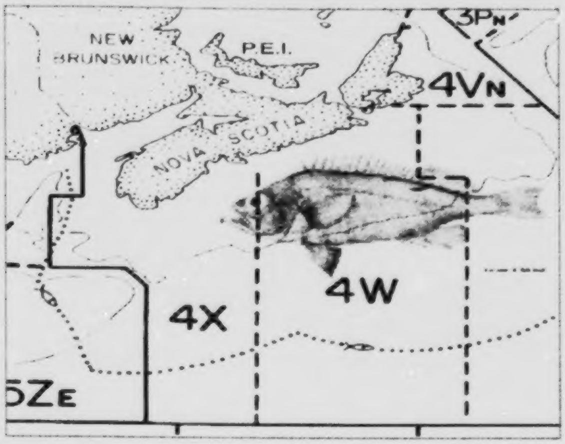
The Council remains concerned about the status of this stock. The Council observes that, while the 1996 year class may be stronger at size than other recent year classes, it is not seen to be as strong as other large year classes which have dominated this stock in the past. Council notes that important new information on this stock has been collected through the joint industry science initiatives, in particular, re-establishment of the commercial fishery index. Further effort of this type, and specifically allowing for more vessels to be involved, should increase confidence in the results.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator: appears very low

Compared to average

REDFISH UNIT 2 - 3Ps4Vs4WFG + 3PN4VN (JUN-DEC)



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council recommended that the TAC for Unit 2 redfish be reduced from 28,000t to 25,000t in 1994. In November 1994, the Council recommended that the TAC be set at 20,000t for 1995 and that a small fish protocol be established to protect juvenile redfish. The Council also recommended that no fishing be permitted in 3Pn and 4Vn during November and December and that scientific work clarify redfish management units and develop a better understanding of migration patterns and stock status. The Council recommended that the fishery be limited as much as practical during the January through June period to avoid taking fish that may, in fact, be fish from Unit 1. The Minister reduced the TAC to 14,000t for 1995 and implemented measures to avoid catching Unit 1 redfish when they could be mixed with redfish from Unit 2.

The Council recommended a TAC reduction to 10,000t for 1996 with: rigid small fish protocols, no fishing in 3Pn and 4Vn during November and December, and limiting, as much as possible, fishing from January to June. In 1997, the FRCC recommended that the TA C remain at 10,000t, small fish protocols be continued and, DFO and Industry discuss the merits of protecting the 1988 year-class.

For 1998 the Council recommended that the TAC for 1998 be set at 11,000t, seasonal and area closures be continued, and the small fish protocol be continued and rigorously enforced and DFO and industry discuss the merits of continuing to protect the 1988 year-class. The FRCC also recommended that DFO Science seek to determine a) the long term potential for this stock, and b) the historical profile of exploitation rates.

1998 CONSULTATIONS:

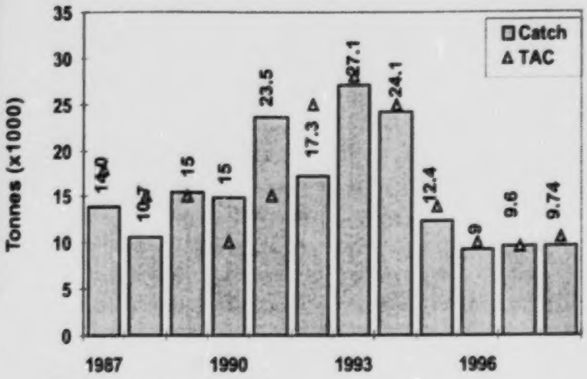
Consultations regarding redfish stocks were conducted in November 1998. At Harbour Breton, inshore industry representatives related how redfish in the Unit 2 stock management area were very plentiful, of a good size, and that the catch rates were among the best in their experience. They advocated that the dedicated redfish survey be re-instated in Unit 2 for 1999.

At an Atlantic-wide consultation on redfish in Halifax, participants also indicated that the condition of this stock appeared to be quite healthy, that the size mix in the catches was good. They related that recruitment

RECOMMENDATIONS:

The FRCC recommends that:

1. the TAC for 1999 be set



* 1998 Catch: as of Oct.7/98

was continuing in this stock, including some evidence of fish corresponding in size to the 1994 year class. Participants also supported the re-establishment of the dedicated redfish survey in Unit 2, noting that other surveys did not cover the entire stock management area at any one time.

ANALYSIS:

The 1998 DFO Stock Status Report indicates that:

- The stock size remains stable at a healthy level.
- There are continue to be signs of good recruitment subsequent to the 1988 year-class (1994 year class).
- A catch of 11,000t in 1999 would generate an exploitation rate of about 6%.

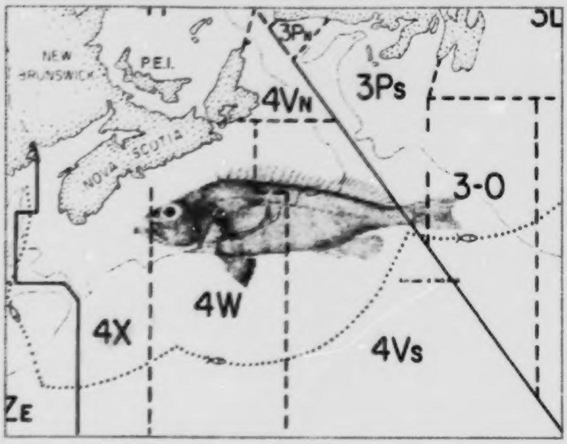
While the Stock Status Report notes stability in the stock, it does not provide an analysis of how the level of the biomass in this stock relates to the long-term average. The Council believes that the 1988 year class is now recruiting and maturing and that while the 1994 year class continues to be positive, it will need to be properly monitored in order to determine its strength. While the Council continues to be optimistic about the potential for increased catch levels for this stock, it is believed it would be prudent to continue a cautious approach toward this increase, pending the outcome of the aforementioned working group process to be finalized during 1999.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator: healthy

Compared to average

REDFISH UNIT 3 - 4WDEHKLX



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993 and November 1994, the Council recommended that the 1994 TAC for Unit 3 redfish be set at 10,000t. The Council also recommended in 1994 that the incidence of small fish be monitored in 1995 and that the area be closed to fishing when the incidence of small fish has reached an appropriate predefined level. In November 1995, the Council reiterated that there was a need for maintaining for 1996 the same small fish closure provisions as recommended in 1994, with a 1996 TAC of 10,000t. For 1997, the Council recommended that the TAC for Unit 3 redfish remain at 10,000t. The Council also recommended that the small fish protocol be consistently applied and enforced, and other measures to avoid small fish should be evaluated, including increased mesh size.

For 1998, the FRCC repeated its recommendations that the 1998 TAC for this stock be set at 10,000t, and that small fish protocol should be consistently applied and rigidly enforced. The Council also recommended that the closed area known as the Bowtie should be redefined to optimize protection of small fish, and that DFO Science should seek to determine more precisely the sustainable catch level for this stock.

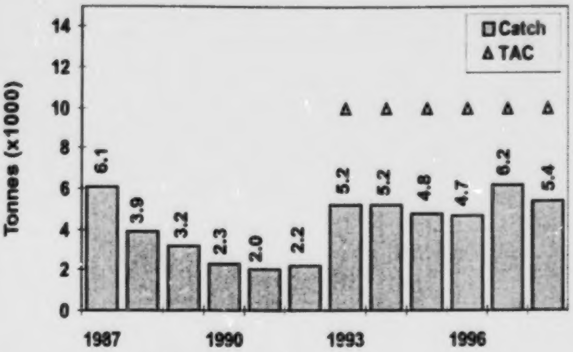
1998 CONSULTATIONS:

Fishers in Unit 3 recognized during consultations that the predominance of effort directed at redfish had shifted to grounds in the western portion of this management unit. Some attributed this to a redirection in the occurance of dogfish in basins in western 4X, the redefinition of the 'Bowtie', and restrictive by-catch and monitoring provisions in place in the eastern

RECOMMENDATIONS:

The FRCC recommends that:

1. the 1999 TAC for Unit 3 redfish be reduced to 9,000t;
2. the



* 1998 Catch: as of Oct.7/98

portion of Unit 3. Other fishers indicated that, in addition to these elements, there has been a meaningful drop in the abundance of redfish in eastern areas, where until very recently, catches had been quite good. Most of the industry feel that the realignment of the area closure for small fish (the 'Bowtie') has been effective at re-directing effort away from this area and that small fish are being protected there.

ANALYSIS:

The 1998 DFO Stock Status Report indicates that:

- Research vessel surveys indicate stability in the resource.
- Decreasing commercial success in the eastern portion of the management area warrant caution.
- Catches of 10,000t in 1999 should not exceed the F0.1 level of 10%.

The Council recognizes and commends the industry and DFO science for modifications implemented during the last year to the closed area to protect juvenile redfish (the 'Bowtie').

In consideration of the biomass index and estimates of survey biomass based on the research survey, the Council observes that not all the grounds available to the resource, and in particular those grounds deeper than 200 fathoms, are included in the survey. For this reason, the survey estimates should be expected to underestimate the true biomass by some extent. However, the Council does not feel that this factor alone can account for the difference between the indicated relative exploitation rate of 15%, which is based on the survey biomass, and the observed exploitation rate of about 6% in Unit 2. In addition, the Council is concerned by the reports of shifts in effort and catches of redfish in the western portion of this management unit, and notes that these shifts are similar to those observed for other commercial species in this same area. For these reasons, and in anticipation of further discussion and resolution of the appropriate exploitation strategy for redfish in this and other management areas in the near future, the Council believes that added caution is warranted for this stock in 1999.

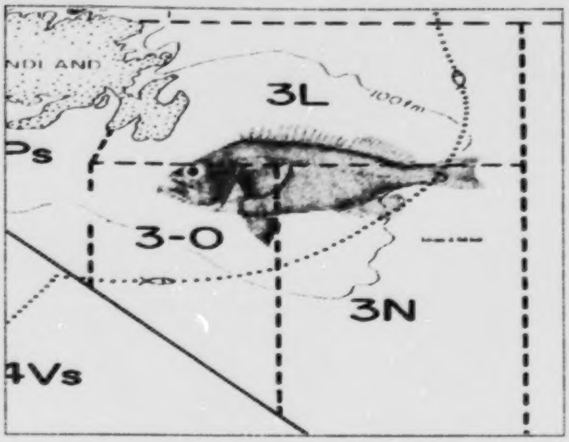
The Council also makes note of the opinion that this and other redfish stocks feature recruitment and growth characteristics which are substantially different from other species, and therefore that they may not be managed to best advantage under the yield-per-recruit model based on the F0.1 level of exploitation.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator: uncertain

Compared to average

REDFISH - 3O



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council recommended reduction of the TAC to 10,000t for 1994. In November 1994, the Council expressed its concern over the uncertainties related to the origin and abundance of small redfish in this Division. The Council recommended that the 1995 TAC be set at 10,000t, that a small fish protocol be established to protect juvenile redfish and that research be accelerated to determine the origin of the small fish found in this Division. The Council recommended a 1996 TAC at 10,000t and continuation of small fish protocols.

For 1997, Council recommended a TAC of 10,000 and further recommended that small fish protocols remain in place and apply to all fleets harvesting the resource throughout the range of the stock. The FRCC also indicated that modifications to gear should be examined to reduce the catch of small fish while minimizing post selection mortality.

For 1998, the Council recommended that the 1998 TAC for 3O redfish be maintained at 10,000t, that further scientific effort be applied to determine sustainable levels of harvesting for this stock; and that small fish protocols remain in place. The Council also recommended that a DFO-industry workshop be established to address the issues associated with the capture of juvenile redfish, including the definition of closed or restrictive areas, with results of this workshop to be included as part of the CHP for all fleets in this fishery for 1998.

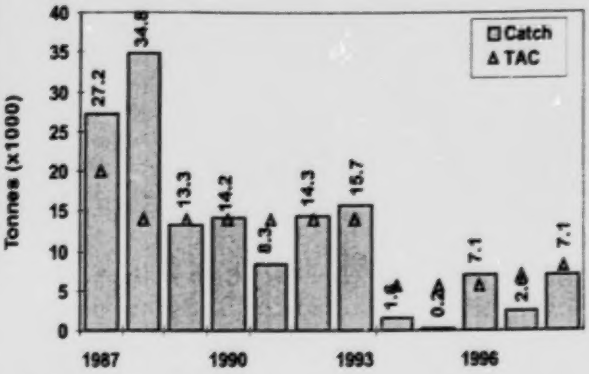
1998 CONSULTATIONS:

The Council held an Atlantic-wide consultation on redfish stocks in Halifax, Nova Scotia on November 19, 1998. The redfish industry participants to this meeting were of the general view that the status of the stock in 3O was similar to the previous year. They related that problems with high proportions of small redfish in the catch had improved during the 1998 fishery, due to the influence of a small fish monitoring and reporting program which encouraged the focus and performance of some participants in the fishery. They felt that this mechanism, and not an area closure, should be used for the time being to continue to address the small fish issue in this management unit.

RECOMMENDATIONS:

The FRCC recommends that:

1. the 1999 TAC for



* 1998 Catch: as of Oct.7/98

ANALYSIS:

The 1998 DFO Stock Status Report indicates that:

- Larger fish remain located predominantly in the deeper, rough-ground portions of the management area that are not surveyed by the research survey.
- It is not possible to describe overall trends in total stock size or to estimate the current size of the fishable portion of the population.
- Catches at the 10,000t level are unlikely to exceed F0.1.
- Relatively few fish less than 17 cm have been observed in recent surveys.

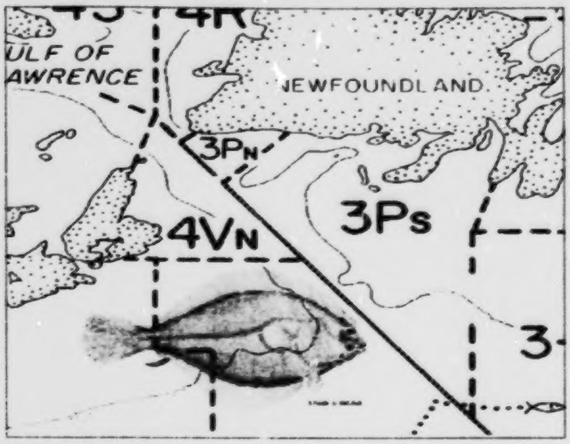
The Council notes that biomass estimates of this stock are uncertain due to the nature of the bottom in this management unit and the apparent distribution of fish by size in relation to this. Therefore, while relative exploitation rates under the current TAC level are 10%, based on the trawlable biomass estimates from the survey, actual exploitation rates would be below that level and are thus felt unlikely to compromise the stock. However, the Council also notes that, as for other redfish stocks, the most appropriate long term exploitation strategy for this stock needs to be considered within the context of the pattern of recruitment for redfish stocks and the capabilities of science and industry to monitor and quantify changes in stock size and characteristics.

The Council recognizes the implementation during the 1998 season of a small fish monitoring and reporting system to address the well documented pattern of landing small redfish from this management unit, and feels that this initiative must be continued in future years.

COUNCIL'S VIEWS ON STOCK STATUS:

Over-all Stock Indicator: stable

AMERICAN PLAICE - 3Ps



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council noted that this stock had declined below any previously-observed level and that there were no signs of good recruitment. The Council recommended that there be no directed fishing and that by-catches be limited to 500t during 1994. The recommended by-catch limit was further reduced in 1995. Closure and minimal by-catch were again recommended for 1996.

With no new scientific data available, and no evidence of a change in status of this stock, the advice of previous years - no directed fishing and a by-catch TAC of 100t - was reiterated for 1997. It was also recommended that cooperative science-industry surveys be encouraged in an attempt to increase the data base on the current and ongoing status of this stock.

For 1998, The Council once again recommended that there be no directed fishing of this stock and that by-catch protocols be applied when prosecuting other fisheries. The Council also recommended the encouragement of cooperative science-industry surveys.

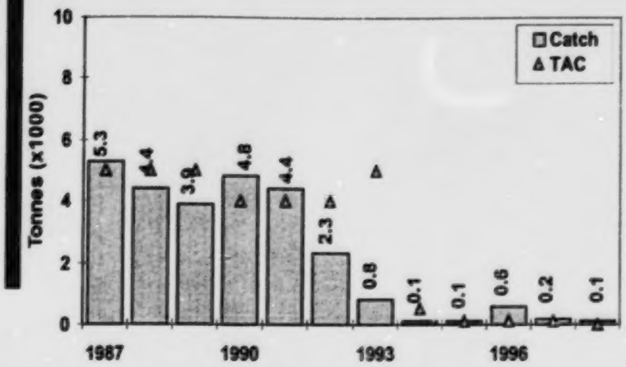
1998 CONSULTATIONS:

The FRCC held public consultations on this stock in Harbour Breton, Newfoundland on November 16 and in Clarenville, Newfoundland, on November 17. During 1998 consultations there were suggestions from inshore fishermen that there appeared to be a greater abundance of American plaice in inshore waters. There were suggestions again, as in past years, that the plaice seen in inshore waters (particularly in the Bays) were distinct from the offshore American plaice. Since the research vessel survey does not cover all the area it was again suggested that industry - science surveys outside the area covered by the research vessel survey should be conducted. Participants in the offshore fishery stated that there was difficulty conducting the witch flounder fishery due to excessive by-catch of American plaice. Frustration was expressed at the fact that there was three years of Campelen data that was not comparable

RECOMMENDATIONS:

The FRCC recommends that:

1. there be no directed fishing



* 1998 Catch: as of Oct.7/98

to the previous Engels data since the conversion from Engels to Campelen had not been done to date.

ANALYSIS:

The 1998 Newfoundland Region Groundfish Overview indicates that:

- This stock remains at a very low level.
- Surveys still show a lack of recruitment.
- Surveys conducted in 1995, 1996, 1997 and 1998 all give very low biomass estimates for this stock.

From the 1996 DFO stock status report we note that catches of 3Ps plaice were highest from 1968-1973 and averaged over 10,000t. Since 1980, catches have exceeded 5,000t only twice and there have been clear indications that the stock has declined dramatically. Research vessel surveys continue to indicate that the stock is at a very low level. All age groups have declined and recruitment in recent years has been very low. The outlook for this stock is very pessimistic.

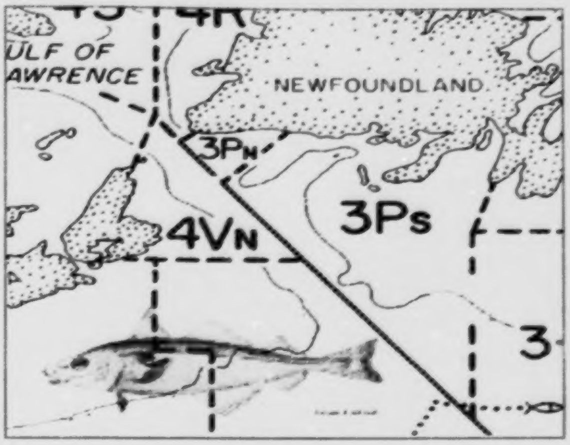
The 1998 DFO Newfoundland Region Groundfish Overview continues to have a pessimistic view of this stock and states that "In the short to medium term there continues to be no prospect for stock rebuilding."

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator: poor

Compared to average

HADDOCK - 3PS



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council noted that the TAC had been reduced to 500t for 1993, from 3,200t in 1992. The by-catch of haddock was significantly reduced because of closures in fisheries for other species. The Council recommended that there be no directed fishing for the 3Ps haddock stock in 1994 and that by-catches be limited to 500t. In November 1994, the Council reiterated its advice for no directed fishery and recommended reducing the by-catch limit to 100t during 1995. This advice was repeated for 1996.

In October 1996, the Council recommended that there be no directed fishing for 3Ps haddock in 1997 and that by-catches be limited to 300t and implemented so as not to impede a limited cod fishery.

For 1998, the Council repeated its recommendation that there be no directed fishery of this stock and that by-catch protocols be applied when prosecuting other fisheries.

1998 CONSULTATIONS:

The FRCC held public consultations on this stock in Harbour Breton, Newfoundland on November 16 and in Clarenville, Newfoundland, on November 17. In both Clarenville and Harbour Breton there were suggestions that large haddock were evident in the offshore area and that it had presented some by-catch problems in the gillnet fishery on St. Pierre Bank. There appeared to be consensus that this stock was still in a depressed state and needed to be rebuilt.

ANALYSIS:

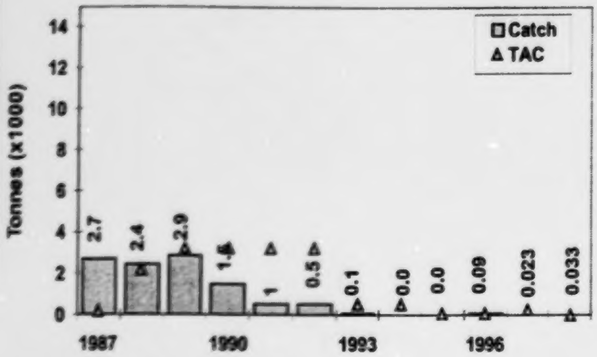
The 1998 Newfoundland Region Groundfish Overview indicates that:

- This stock increased in mid-1980's due to the 1981 year class, which has been fished out.
- There are no signs of improved recruitment in recent years.
- Without recruitment, this stock will not increase.

The 1996 stock status report indicates that haddock in Newfoundland waters are at the northern limit of their range in the NW Atlantic. There are few indications of improved recruitment in this stock and there are no prospects of the stock increasing in the near future. The abundance of large fish appears to have increased inshore; an increase in effort for cod would likely exploit this abundance. As this species is taken as by-catch, it is anticipated that catches will increase when cod fishing is re-opened.

RECOMMENDATIONS:

The FRCC recommends that:



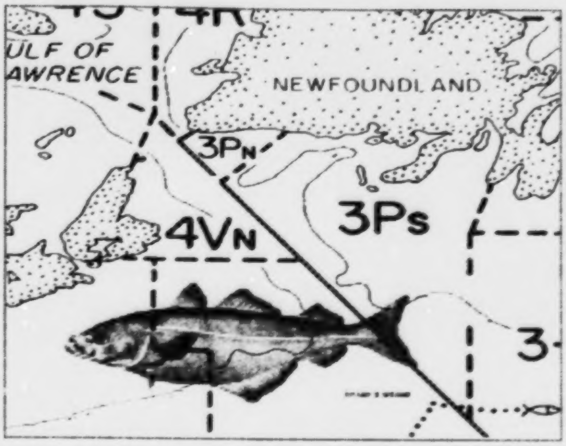
* 1998 Catch: as of Oct.7/98

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator: low

Compared to average

POLLOCK - 3PS



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council noted that there were very few pollock in 3Ps and the TAC was reduced from 5,400t to a 600t by-catch limit. The Council recommended that there be no directed fishing for the 3Ps pollock stock in 1994 and that by-catches be limited to 500t. In November 1994, the Council re-iterated its advice for no directed fishing in 1995 and recommended reducing the by-catch limit to 100t. This recommendation was repeated for 1996.

In October 1996, the Council recommended that there be no directed fishing for 3Ps pollock in 1997 and that by-catches be limited to 1,500t, and implemented so as not to impede a limited cod fishery.

For 1998, the Council once again recommended that there be no directed fishing for 3Ps and that by-catch protocols be applied when prosecuting other fisheries.

1998 CONSULTATIONS:

The FRCC held public consultations on this stock in Harbour Breton, Newfoundland on November 16 and in Clarenville, Newfoundland, on November 17. Many fishermen suggest that pollock appear to be much more abundant than the research vessel survey suggests. Fishermen at the Harbour Breton meeting reported an abundance of good sized pollock in the inshore, shallow water area. As well fishermen fishing on the St. Pierre Bank and Gully's areas report significant occurrences of pollock resulting in the shut down of the white hake fishery in September. Many fishermen suggested that there be a TAC of between 1500-2000t set for this stock, allowing flexibility in the by-catch levels and possibly a directed fishery.

ANALYSIS:

The 1998 Newfoundland Region Groundfish Overview indicates that:

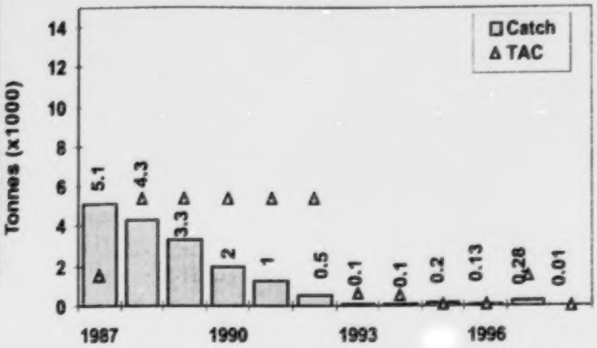
- The fishery is opportunistic, and based on the occurrence and survival of year classes against great odds in the extreme north of their range.
- Recent surveys showed low abundance and biomass.

The 1996 stock status report indicates that pollock in Newfoundland waters are at the northern limit of their range in the NW Atlantic. Recruitment to commercial fisheries has been unpredictable. Commercial catches have varied greatly and have been based on occasional pulses of abundance. Because of the pelagic nature of pollock, research vessel estimates of abundance are difficult to interpret and may not be reliable. Recent research surveys indicate poor abundance. However, in

RECOMMENDATIONS:

The FRCC recommends that:

1.



* 1998 Catch: as of Oct.7/98

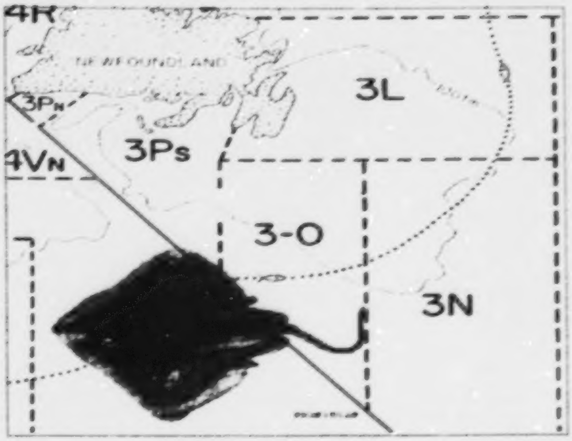
1995, there were many small pollock reported around wharfs by fishermen. Exceptionally large fish in unusual quantities have appeared throughout 3Ps recently and there continues to be good evidence of young fish inshore.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator: unknown; appears to be increasing

Compared to average

SKATES - 3LNOPs



HISTORY OF FRCC RECOMMENDATIONS:

A directed fishery for skates developed on the southern Grand Banks during 1993. Council conducted its first review of this stock in 1995 and recommended a precautionary TAC of 2,000t for 1996 for this new fishery. It was further recommended that steps be taken to distribute effort throughout the management area to prevent heavy exploitation on concentrations. For 1997, Council acted further in its efforts to have the fishery distributed across the entire stock area. Council recommended a 3,000t TAC for 1997 with a provision that it be divided among three separate management units, 3LN, 3O AND 3Ps, as defined in the 1996 stock status report. As well, to supplement information gathering on this resource, cooperative industry science initiatives were encouraged.

For 1998, the FRCC recommended that 3LN, 3O, and 3Ps continue to be treated as separate management areas; and that the overall TAC be set at 3,000t.

1998 CONSULTATIONS:

The FRCC held public consultations on this stock in Harbour Breton, Newfoundland on November 16 and in Clarenville, Newfoundland, on November 17. There were no specific comments about the health of the skate resource made during the consultation meetings at Harbour Breton and Clarenville. However, there were concerns expressed about the level of halibut by-catch in this fishery and that it may be excessive.

ANALYSIS:

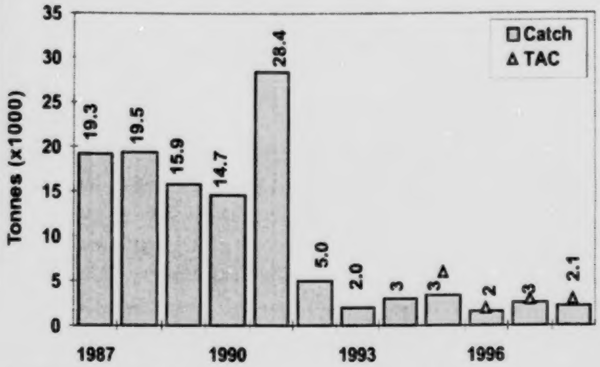
Of the 8-10 species of skate found in waters around Newfoundland and Labrador, thorny and smooth skates comprise the bulk of catches by commercial fishery and research vessels. Although thorny skates are widely distributed, tagging studies reveal they exhibit limited movement, with re-captured animals found infrequently beyond 100 kms of the site of initial capture.

In comparison to an individual cod which can release millions of eggs a year during a relatively short spawning period, a female skate will lay only 6-40 eggs throughout the year. Special challenges are presented by the limited reproduction potential of this species and insufficient biological information.

The 1998 DFO stock status report reveals there has been a continuing decline of biomass across the entire stock area, and particularly for Divisions 3N and 3O during 1996. Catch and catch rate trends have been declining over this same period. The catch of 1,600t in 1996 marked a low for the Canadian directed fishery but this increased of 2,440t in 1997, with the bulk of removals occurring during May and June. The majority of the catch is still taken from Division 3O but the implementation of Council's recommendation for three

RECOMMENDATIONS:

The FRCC recommends that:



* 1998 Catch: as of Oct.7/98

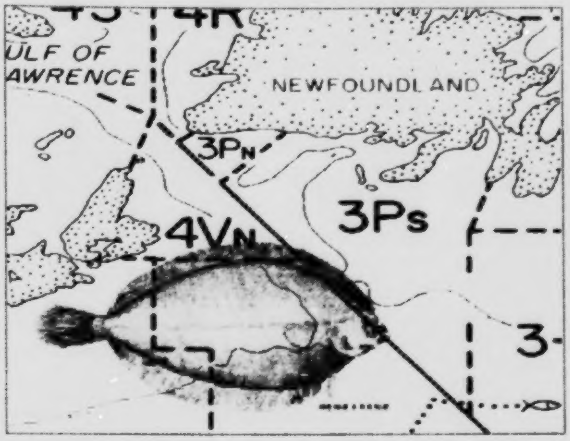
separate management units for 1997 has begun the process of shifting effort across the entire stock area. Due to the sedentary nature of skates and their tendency to form local aggregations, the DFO SSR suggests that management on a level finer than three Divisions may be prudent. The serious deficiency of biological and abundance information on this resource has been emphasized.

COUNCIL'S VIEWS ON STOCK STATUS:

Over-all Stock Indicator: stable at low level

Compared to average

WITCH FLOUNDER - 3PS



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council noted that this stock had been relatively stable and recommended that the TAC level of 1,000t be maintained for 1994. In November 1994, the Council re-iterated its recommendation for the continuation of a TAC level of 1,000t for 1995. Because biomass estimates were historically low the Council recommended that the TAC be reduced to 500t for 1996 and again in 1997. For 1997 the Council recommended that an industry /science survey be encouraged.

For 1998, the Council recommended that the 1998 TAC for 3Ps witch flounder be set at 650t, and to meet optimum maturity levels for this stock, the mesh size be set in accordance with selectivity studies. The Council also recommended that since there had been no new assessment of this stock since 1996, a joint DFO/industry study be conducted in the inshore areas to assist in the overall assessment process such as appropriate biological sampling, a tagging/movement component, and identification of stock sub-components.

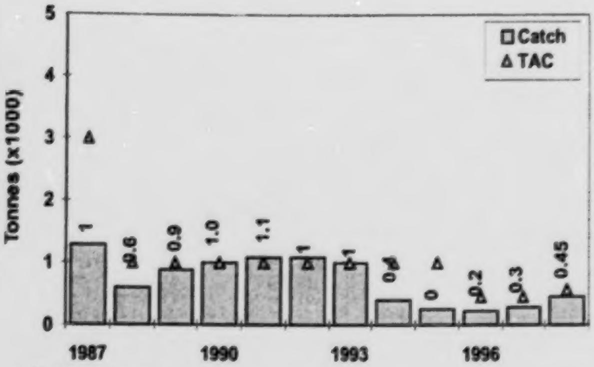
1998 CONSULTATIONS:

The FRCC held public consultations on this stock in Harbour Breton, Newfoundland on November 16 and in Clarenville, Newfoundland, on November 17. It was stated by the danish seiner representative at the Harbour Breton meeting that catch rates in the Fortune Bay area had increased dramatically in recent years, and were some of the highest catch rates ever seen by this fleet. Offshore representatives suggested that it was difficult to comment on the state of the stock since the American plaice by-catch limited that sectors ability to fish and the research vessel data was not comparable to previous years since the Campelen/Engels conversion had not been done for this stock.

RECOMMENDATIONS:

The FRCC recommends that:

1. the 1999 TAC for 3Ps witch floun-



* 1998 Catch: as of Oct.7/98

ANALYSIS:

The 1998 DFO Newfoundland Region Groundfish Overview indicates that:

- There is an increasing trend in the biomass estimates from 1996 -1998. However this may reflect growth of individuals since estimates of abundance remained stable during the same period.
- Catches at the level of the current TAC are not likely to cause a decline in this stock.

Quota for witch were first set in the mid-1970s at 3,000t; these were reduced to 1,000t in the late 1980's Catches come mainly from St. Pierre Bank in depths of 200-900 m. The research survey relative biomass index has shown substantial variation but no trend between 1976-1994. The research survey does not cover Fortune Bay where 35% of the catch occurs. The survey biomass index was high for 1996 but this may reflect a more efficient survey trawl used for the first time that year. However the survey biomass index has continued to increase in 1997 and 1998 so that in 1998 it is almost 100% higher than that seen in 1996. Recruitment levels are at the long-term average.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator: about recent average

Compared to average

CHAPTER 5:

GROUNDFISH STOCKS IN THE GULF OF ST. LAWRENCE AND COD STOCKS IN DIVISIONS 2GH AND 3PS

INTRODUCTION

This report is the third in a series of reports the Fisheries Resource Conservation Council (FRCC) has produced to provide advice to the Minister of Fisheries and Oceans on conservation requirements for Atlantic and eastern Arctic groundfish stocks for 1999. This report deals with all groundfish stocks in the Gulf of St. Lawrence as well as cod stocks in Divisions 2GH and 3Ps.

In the past, the FRCC has produced a single report annually which included advice for all groundfish stocks. Beginning in 1998, the FRCC produces separate reports for different stock areas. These separate reports allow the most recent information on the state of the groundfish stocks to be used in formulating our recommendations. For the 1999 fishery, the Council has already produced two other reports - 1999 Conservation Requirements for Groundfish Stocks Other than Cod in Sub-Area 0 and Area 2+3 (October 1998 - FRCC.98.R.5) and 1999 Conservation Requirements for Scotian Shelf and Bay of Fundy Groundfish Stocks, Redfish Stocks, Units 1-3 and 30 and Groundfish Stocks in Division 3Ps (November 1998 - FRCC.98.R.6).

For 1999, the Department of Fisheries and Oceans (DFO) Science held a special zonal assessment in Rimouski, Quebec for the following cod stocks: 2J3KL, 3Ps, 4RS,3Pn and 4TVn. This special assessment was held from March 1-12, 1999 in order to incorporate all available information into the assessment including the fall and winter groundfish surveys, and the results of the 1998 sentinel fishery. The FRCC believed that it was important to have the results of the latest assessment before we consulted on these stocks.

CONSULTATIONS

Before making its recommendations the FRCC conducted a series of public consultations throughout the Maritimes, Quebec and Newfoundland and Labrador. In the fall of 1998 the FRCC conducted a round of public consultations in Newfoundland on stocks other than cod, and in Nova Scotia on all Scotian Shelf and Bay of Fundy groundfish stocks. In April 1999, the FRCC held an extensive round of consultations in Gaspé, Cap-aux-Meules, Moncton, Port Hawkesbury, Port-aux-Basques, Port-au-Choix, Grand Falls and Clarenville on Gulf groundfish stocks and the 2J3KL and 3Ps cod stocks. Over 1,000 fishers, scientists and other stakeholders participated in these April consultations and others who could not attend submitted their views in writing.

GULF COD STOCKS

In previous years, industry representatives have questioned the basis for differences in the Council's recommendations for the cod stocks in 4RS3Pn and 4TVn. The concern centers primarily on the ratio between the proposed TAC, or overall removals, and the biomass, as reported in the Stock Status Report (SSR). In making its recommendations, the FRCC recognizes that, although the two stocks are adjacent to one another, the ecosystem they belong to are quite distinct and different. For instance, the 4T area supports species like American plaice and white hake, while the 4RS ecosystem supports species like capelin and shrimp. Historically, the Northern Gulf Cod stock has been approximately 1.5 times more productive than the Southern Gulf Cod stock. According to scientific assessments, the Northern Gulf Cod did not experience such low recruitment levels as observed in the Southern Gulf and it is presently recovering more rapidly. FRCC recommendations reflect these considerations as well as other factors such as geographical distribution and the fish condition factor.

In considering the Gulf groundfish stocks, the Council was struck by corresponding changes to the summer distribution of a number of migratory stocks. To generalize, the abundance of these stocks, which include both Gulf cod stocks, several flatfish species and white hake, is currently much lower than historical levels in the western portion of the summer range. At the same time, the abundance of these stocks over the eastern portion of their summer range is either less reduced, unchanged or even increased.

While this phenomenon has received passing attention from DFO Science on a stock by stock basis, the Council believes there would be benefit in a synoptic review and analysis of such distributional shifts through time in Gulf stocks. Taking a multi-species approach may shed more light on possible causes underlying these observed shifts. Additionally, as stocks rebuild in future and the prospect for reopening and/or increasing quotas improves, decision-making on these issues will benefit from having a clearer view on these distributional shifts and the relationship between stock distribution and stock status.

4TVn Cod

The divergence of view between scientists and fishers is nothing new and is found in most stocks. This is one of the challenges facing the Council each year as it discusses its recommendations. However, the Council is concerned that the divergence of views regarding this cod stock is particularly wide. Discussions within the Council on what level of catch should be set for this stock were therefore particularly difficult. In cases such as this, it has become increasingly difficult for the Council to 'pick and choose' between the scientific evidence and the evidence provided by fishers. In the end, however, conservation must come first. While for 1999 the Council has recommended an increase in total removals, we continue to be concerned over the long-term well being of this stock if appropriate action is not taken to protect the incoming 1995 and 1996 year classes.

While the Council has recommended a 6,000t TAC for this fishery for 1999, we continue to be concerned with the current depressed state of the stock and the possibility of decline. **Therefore, we feel that no major changes in the TAC are likely to occur in the near future.**

4RS3Pn Cod

It is clear from the SSR and the views of stakeholders during consultations that there are positive trends in this stock. However, while fishers were unanimous in their belief that the stock could support a TAC of 10,000t in 1999, the Council prefers to be more precautionary. There is near universal agreement among scientists and fishers that this stock is still at low levels compared to the historic levels and stock potential. During consultations it was made clear to Council members that, for a number of reasons, fishers believe the biomass level is somewhat higher than that suggested by the SSR. Nevertheless, in the Council's view, key rebuilding indicators remain depressed.

As with the 4TVn cod stock, it is difficult for Council to 'pick and choose' between the input from DFO scientists and that from stakeholders. The Council has therefore taken more of a middle road and recommended a TAC of 7,500t. However, fishing cannot be concentrated on the 1993-year class and **effective** conservation measures must be put in place and rigorously adhered to if we want to see the biomass continue to improve.

The Council believes that a slight increase in the TAC this year is warranted but wishes to emphasize that the conduct of the fishery will have a significant impact on what the health of the stock will be next year.

2J3KL Cod

The 2J3KL cod stock was assessed at the Zonal Cod Assessment held in Rimouski March 1-12, 1999. At that time, Dr. George Winters, under contract with the Fisheries, Food and Allied Workers Union (FFAW) in Newfoundland, presented a paper that indicated a much more optimistic view of the stock than that which was finally adopted by the other scientific participants of the session. Dr. Winters subsequently presented his findings at a number of the consultations with stakeholders, which has raised the expectations of many fishers for a much-expanded fishery.

Unfortunately, Dr. Winters' analysis did not receive full and proper peer review at the March 1-12 session. Shortly after the Council held public consultations on this stock the Minister requested that the Council delay any recommendations on 2J3KL cod until after a panel of outside experts has had an opportunity to review Dr. Winters analysis.

Therefore, our current report will not contain any recommendations regarding a TAC level or other management measures for any fishery in 1999. Those recommendations will come at a later time following the panel's review. However, the Council believes it important to make a number of observations and recommendations on this stock even in the absence of any overall quota or TAC.

The Council has noted that more and more fishers are becoming involved with DFO Science in a number of programs that greatly assist in providing information that is proving valuable for assessment purposes. One of these programs is the Sentinel Fisheries Program. The Council firmly believes that not only is it important to continue this program in the 2J3KL area but also that it **should begin immediately** and involve the tagging of fish as well. We cannot wait until decisions are made later in the year on possible levels of catch in any limited commercial fishery or expanded index fishery. The collection of information needed for inclusion in future scientific assessments must begin now.

The Council is also struck by the difficulty to date in determining whether or not there is a separate inshore biomass and the level of such biomass. Work on this front should begin as soon as possible and should include acoustic surveys. The Council believes that acoustic surveys can add valuable information, not just for this stock, but in other areas as well and encourages the Department to make more use of such surveys. Fishers see increasing amounts of fish in inshore bays and are finding it harder and harder to accept the standard view of only one stock biomass. There must be a way of determining if there is a separate inshore biomass, and if so at what level it is. The necessary work must begin immediately on this problem.

The third concern of the Council relates to the possible bycatch of 2J3KL cod in the burgeoning shrimp fishery, particularly in Division 3K. It is imperative that the shrimp fishery be monitored closely for bycatch, particularly in the Hawke Channel.

Although the Council is not in a position to recommend any overall quota or TAC or specific conservation measures for 2J3KL at this time, it nevertheless makes the following recommendations:

1. **The sentinel program in 2J3KL begin as soon as possible, and not wait for future decisions on overall quota or TAC levels, and that it contain a tagging component;**
2. **Consideration be given to introducing acoustic survey work into the traditional survey program to assist in determining whether or not there is a separate inshore component to the stock, and if so, the level of such biomass; and,**
3. **The shrimp fishery in 3K be closely monitored for bycatch, especially in the Hawke Channel.**

3Ps COD

In November 1998 the Council made some recommendations regarding this stock including an interim TAC level while awaiting results of the 1999 assessment which was to be determined during the Zonal Assessment Process in March 1999.

In our report on conservation requirements for groundfish stocks in 1998 and in our report for conservation requirements for 1997, *Building the Bridge*, the FRCC recommended to the Minister that measures be taken to reasonably spread the effort for the 3Ps cod stock over the period of the fishing year to minimize impact on stock sub-components. Therefore, in November 1998 the Council recommended an interim TAC of 6,700t be put in place for the first four months of 1999 so that a fishery could begin in January and not have the entire final TAC caught in only the latter part of the year.

The Council wishes to register its disappointment that its recommendation in this regard, which was intended to spread the 3Ps cod catches over time and area has not been effectively implemented. Although fishing by some fleets began in January, the majority of the fleets have either recently begun their fishery or are just about to begin.

The Council firmly believes that this is one stock that continues to improve and some believe that it has rebuilt. The Council is of the view that the stock has rebuilt to its current level primarily because the 1989 and 1990 year classes have been protected. Unfortunately, information has been provided that indicates some fishers are increasing their mesh sizes (gillnets) in order to target these larger fish. The Council is gravely concerned over this turn of events and firmly believes that these larger fish must be protected. The current rebuilding of this stock has been dependent on the survival and spawning success of the abundant 1989 and 1990 year classes. Consequently the Council has recommended that immediate measures be implemented to restrict the ability of fishers to target these fish. Should adequate measures not be put in place, the Council is of the view that in future this stock may not be as robust as it appears to be now.

Throughout our consultations this year, as in past years, many stakeholders have expressed concern over the mixing of stocks. Although there has been considerable concern over the mixing of the 4RS3Pn cod stock in 3Ps during the winter months, there is also considerable mixing of 3Ps cod into Division 3L. In the past the Council has recommended, and the Department has implemented, the necessary closed time during the winter months on Burgeo Bank to protect the 4RS3Pn cod. However, work needs to be undertaken to assess the extent of the mixing of 3Ps cod in 3L.

It is recommended that:

1. **The necessary work be undertaken to determine the extent of the mixing of 3Ps cod in Division 3L and the time of year such mixing is most prevalent**

4RST ATLANTIC HALIBUT

Although the Council continues to recommend that any halibut less than 81 cm be released, there is growing concern that this may no longer be an appropriate conservation measure. At the time the measure was first put in place, it was estimated that 80% of the released fish survived. Recent studies, however, indicate that perhaps only 30% survive. There is also believed to be a wide range of survival rates depending on the gear being used and how the caught fish are subsequently handled.

Before any change is made to the existing measure, there needs to be a careful study undertaken on survival rates including any differences between different gear types.

GROUNDFISH CONSERVATION FRAMEWORK

In the Chairman's Report contained in our 1998 Annual Report, *Conservation Must Be Compulsory, Not Optional* (May 1998 - FRCC.98.R.2), we emphasized that Council's 1997 report - *The Groundfish Conservation Framework for Atlantic Canada* (July 1997 - FRCC.97.R.3) should be accepted as the minimal requirements for a sustainable fishery.

We cannot emphasize enough the necessity to base the foundation of our groundfish fishery on the Council's Conservation Framework. To put conservation anything but as the number one priority is to give up all that we have gained, and the sacrifices we have made, over the past few years of moratoria and reduced TACs. The end of income support programs, such as TAGS is putting tremendous pressure on everyone to find enough fish to keep everyone working. The Council has long advocated that there is excess capacity in the groundfish fleet and although there have been attempts to reduce these numbers, such reductions have been minimal in the overall capacity. This is unfortunate as with increasingly good signs in many stocks, there is increasing anticipation by fishers that things will soon be back to normal. **This is not the case.**

As noted in the Chairman's Report, even with strict controls and enforcement the bulk of the 1997 3Ps cod was caught in less than six days and the mentality was clearly one that focused on a race for fish. Even though in 1998 there was a much more controlled fishery, Council is still concerned about the reported highgrading and dumping in 1998. Conservation and maximizing the benefits of the resource should come first.

We would like to think that attitudes have changed. We would like to think that all stakeholders have embraced the need for conservation. But we do not believe this to be the case. However, we are confident that enough have seen the errors of the old ways. We are confident that the recommended catch levels we have recommended for the stocks contained in this report are sustainable, **but only if the Department and industry embraces the types of conservation measures outlined in our conservation framework document.** To merely pay lip service to conservation will very quickly lead our stocks back into trouble. And, who will we blame this time?

SENTINEL SURVEYS

Since the Council first recommended that Sentinel Survey Programs be set up in areas where moratoria were in place, the information gathered by this program has begun to pay off. The information is becoming another valuable piece of the puzzle used by scientists in their assessment of stocks.

The Council firmly believes that Sentinel Surveys be maintained.

TAGGING PROGRAM

Over the past two or three years, stock identification and migratory movements of fish have been a serious concern, especially in 3Ps, 4RS3Pn and 4TVn. In 1998, our Science Priorities Letter to the Minister of Fisheries & Oceans recommended that a major tagging program, using the most appropriate mix of technologies, be implemented on cod stocks as soon as the summer of 1998 to help clarify exchanges between stock management units. The letter went on to suggest that 1998 should become known as "The Year of Tagging Programs".

While tagging of fish was carried out in 1998, the Council believes that **the program should become a higher priority and implemented immediately in all these stock areas.**

COD GROW-OUT

With continuing limited resources available, the idea of cod grow-out is worthy of mention and should be encouraged.

RECREATIONAL AND FOOD FISHERIES

The Council has previously recommended that where moratoria exist, there be no recreational or food fishery. **The Council wishes to reiterate this recommendation.** What we have heard through consultations is that these types of fisheries have been ongoing and in most cases with very little, if any, control.

If there is to be recreational or food fisheries in any area, then they must be controlled. In this regard, we wish to repeat our recommendation from 1998:

The FRCC again recommends that in areas where moratoria exist there be no recreational or food fisheries.

We further recommend that in areas where limited fishing is permitted the recreational or food fishery be limited to a certain "season" such as one day per week for three weeks, or one weekend per year. In the case of tour boat operators, the FRCC recommends that they be licensed by the Department of Fisheries and Oceans and this licensing system must be strictly enforced. This licensing system be vigorous enough to separate legitimate operators from those who wish to use this tourist fishery as a disguise to continue commercial fishing. Operators should have to abide by strict Conservation Harvesting Plans, fill out mandatory logbooks, adopt a system of maximum number of tags per season, and the number of cod per person should be reduced from ten to two. If these measures cannot be adopted for the 1999 fishing season the FRCC recommends that there be no tour boat fishery for 1999 in areas where moratoria exist.

It must be emphasized that no fishery, whether commercial or recreation, be permitted to proceed unless proper monitoring systems are in place. At the end of the day, we must know what the total removals have been.

FOLLOW-UP TO RECOMMENDATIONS

Each year the Council makes numerous recommendations to the Minister on TACs and other conservation measures for groundfish stocks. Generally, the Minister responds fairly quickly, and publicly, on his decision for TACs. Unfortunately he rarely provides the Council or the public with his views on the Council's other conservation recommendations, which most of the time are just as important, and in some cases more so, than the TAC itself. It has generally been left to the Department, either unilaterally or in partnership with industry, to decide whether or not to adopt these other recommendations and how to implement them.

During the most recent round of consultations with stakeholders, Council members heard concerns expressed, particularly in Port Hawkesbury, regarding this lack of any public statement from the Minister indicating whether or not he has accepted any of the other specific recommendations. Fishers complained that in many instances the Council's recommendations were open to interpretation by fisheries managers and in some instances were applied differently by managers in different Regions. The Council shares these frustrations and agrees that the process needs change.

Aside from specific TAC recommendations, the Council makes recommendations regarding the management of the fishery on issues such as improved mesh size, closures, protection of spawning areas, etc. It also makes recommendations respecting the need for scientific work on specific stocks. Council members understand that the Minister cannot respond to these types of recommendations as quickly as he does with the TAC recommendations. Nevertheless, it is becoming increasingly important that a formal public response be given as soon as possible to these other recommendations. Whether or not the Minister, or the Department, accepts those Council recommendations regarding management of the fishery should be known before the fishery begins.

The Council recommends that the Minister of Fisheries and Oceans respond publicly to all its recommendations within a reasonable timeframe. If he chooses not to accept any recommendation, the rationale for not accepting the recommendation should be provided to Council and industry.

SEALS

The mandate of the FRCC stipulates that "the Council may recommend any measures considered necessary and appropriate for conservation purposes..". These include rebuilding groundfish stocks that have been seriously depleted to allow strong, sustained production of young fish.

The burgeoning size of the seal herds and their expanding range throughout the Atlantic zone has resulted in an increased population that exceeds historical levels[1]. These populations of harp, grey, and hooded seals together kill more cod from Canadian stocks north of Halifax than any other known factor. In the meantime, cod stocks in the Northwest Atlantic, after more than 6 years of moratoria, have been declared "vulnerable" by COSEWIC.

As demonstrated in recent assessments of cod stocks such as in the Northern Gulf of St. Lawrence (4RS3Pn cod[2]), and on the Scotian Shelf (4VsW cod[3]) the seal herds consume tens of millions of juvenile cod and millions more of adult spawning cod. Seals are indisputably a key factor in reducing the recruitment of cod to the fishery. As well, we note that the single cod stock in the Northwest Atlantic considered recovered, namely, the southern Newfoundland/St. Pierre Bank stock (3Ps cod), is the only stock that does not have a large number of seals occurring within its stock range. The accumulated evidence from scientific assessments, as well as the consistent, continual, and corroborating information from fishermen throughout Atlantic Canada is such that the FRCC is convinced beyond any reasonable doubt that the conservation of groundfish stocks, most notably cod, will continue to be jeopardized if the seal herds remain at their current levels.

Given that the seal herds are now at or near carrying capacity[4], and based on current and historical data, the seal herds can be sustainable at a reduced population level. In applying the precautionary approach to groundfish management, action must be taken immediately in order to improve opportunities for the conservation and recovery of cod and other groundfish stocks, without waiting for absolute scientific proof of the effects of seal predation. As a guideline for the preparation of seal harvest precautionary management plans, **we strongly suggest that the seal herds be reduced by up to 50% of their current population levels.** Reductions should be studied intensively to monitor their impacts and form a basis for adaptive management.

To this end, the FRCC makes the following series of recommendations that pertain to: (1) general aspects in the reduction of the seal herds in the Northwest Atlantic, and (2) specific applications directed at protecting fish stocks in particular areas of the zone.

A. PRINCIPAL RECOMMENDATION

I **Reduce the seal herds by up to 50% of their current population levels in specific areas and use such reductions as a basis for scientific study and adaptive management.**

B. GENERAL RECOMMENDATIONS

II. **Commit new resources toward coordinating seal harvest management plans, and the strict monitoring, control and enforcement of appropriate regulations in the harvest of seals including utilization of carcasses, humane harvests, and minimization of the incidences of struck and lost.**

III. **Establish a Northwest Atlantic Working Group and Coordinating team responsible for: (1) the organization and development of strategies for immediate seal reduction effort; (2) promotion of humane harvesting techniques; and, (3) other activities as deemed appropriate.**

C. SPECIFIC RECOMMENDATIONS

IV. **Establish an experimental seal harvest for grey seals on Sable Island for the collection of scientific data and industry development activities. This experimental fishery should not exceed the current annual replacement value estimate of 20,000 Sable Island seals.**

V. **Define a limited number of experimental seal exclusion zones in each of the 2J3KL (Northern cod) fishery, the 4TVn (southern Gulf of St. Lawrence cod) fishery, and the 4RS3Pn (northern Gulf cod) fishery for the purpose of preventing the expansion of seals into the fishery, designated bay, or area. This measure is designed to protect spawning and juvenile cod concentrations and prevent seals from inflicting high mortality on localized coastal aggregations of cod on which limited fisheries are being carried out.**

1 Stenson, G., Healy, B., Shelton, P.A., Sjare, B. 1999. Recent Trends in the Population of Northwest Atlantic Harp Seals, Phoca groenlandica. DFO Working Paper; Lesage, V., and Hammill, M. 1998. The status of the grey seal (halichoerus grypus) in the Northwest Atlantic. DFO Report to COSEWIC.

2 DFO. 1999. Cod in the Northern Gulf of St. Lawrence. DFO Science Stock Status Report. A4-01(1999).

3 DFO. 1999. Cod on the Scotian Shelf. DFO Science Stock Status Report.

4 Stenson et al, and Lesage and Hammill, Op. Cit.; the stock at carrying capacity, i.e., zero growth, is at higher risk of stock collapse due to habitat sharing and disease outbreaks.

ENVIRONMENTAL OVERVIEW

NEWFOUNDLAND AND LABRADOR

Along the Labrador and Newfoundland coasts, air temperatures were warmer than usual throughout 1998 resulting in positive annual anomalies of from 0.4° to 1.0° C. The North Atlantic Oscillation (NAO) index was near normal. The warm air masses of 1998, coupled with a reduction in northwest winds during the winter, caused sea ice on South Labrador and the Newfoundland Shelfs to appear late, leave early and be of shorter duration than usual. For the third consecutive year, water temperatures from Labrador to Grand Banks generally showed near or above normal values. At Station 27, off St. John's, the water temperature was near normal.

The warm conditions were also evident from the above normal near bottom temperatures on the Grand Banks during the spring and on the northern Newfoundland Shelf during the autumn of 1998. Off southern Newfoundland water temperatures over much of St. Pierre Bank increased significantly in 1998 to near normal values. This resulted in a dramatic decrease in the amount of bottom covered by temperatures <0°C

GULF OF ST. LAWRENCE

Air temperature over the Gulf was warmer than normal throughout 1998, particularly in the winter and spring. The highest annual anomaly (1.5°C) within 8 stations around the northwest Atlantic was in the Gulf on the Magdellan Islands. Ice coverage was less extensive than usual in 1998 and of shorter duration.

Despite these milder than normal winter conditions, C.I.L. (Cold Intermediate Layer) minimum temperatures surprisingly cooled in 1998 by 0.3° relative to 1997. No satisfactory explanation has yet been found for this unexpected cooling. Not only did the minimum temperature with C.I.L. decline, but also the C.L.I. thickness and volume both increased in 1998. The 100 - 200 m layer throughout the Gulf remained stable relative to 1997 and was close to the long-term mean.

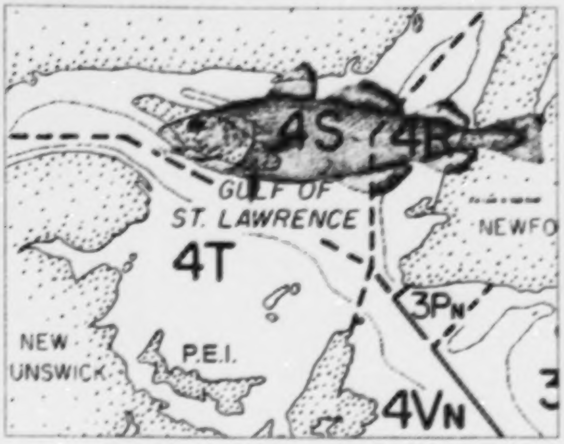
In the 200 - 300 m layer, a slight warming of 0.2° to 0.3 °C was observed in the northwest Gulf and estuary. At the same time, a pulse of colder water has begun to propagate along the Laurentian Channel reaching the Cabot Strait and dropping temperatures by 0.7°C. Dissolved oxygen concentrations were normal in Cabot Strait, but were 2% of oxygen saturation levels below normal in the Honguedo Strait. A stratification index of the upper layer (0 - 30 m as well as 0 - 50 m) shows similar overall values in the 1997 and 1998 groundfish surveys.

There were differences however. The 1998 waters were more stratified than in 1997 in the Estuary and in the northwest Gulf as well as in the Cabot Strait area. On the other hand, the surface was less stratified in 1998 than in 1997 over the Magdellan shallows and northeast Gulf.

In summary, air temperatures over most of the northwest Atlantic were above normal continuing the warming trend of the past 2 years. Indeed, from the Labrador coast through Newfoundland and the Gulf of St. Lawrence, to the Atlantic seaboard south to the Middle Atlantic Bight, 1998 ranked within the top 5 - 15% of the warmest years on record.

The warmer than normal winter temperatures resulted in less ice than normal off Newfoundland and Labrador and in the Gulf of St. Lawrence. Icebergs were greater in number than the long term average but below the record number of the early 1990s.

Cod - 4RS3Pn



History of FRCC Recommendations:

In August 1993, the Council recommended, as a precautionary conservation measure, that the 1993 TAC for this stock be reduced from 31,000 t to 18,000 t, the revised F0.1 level for 1993. In the fall of 1993 and 1994, the Council recommended that there be no directed fishing for the 4RS3Pn cod stock in 1994 and that by-catches be kept to the lowest possible level. In addition, the Council recommended for 1995 that there be no recreational/food fishery on this cod stock and that a broad based Sentinel Fisheries program be implemented. In November 1995, the Council reiterated that there was a need to continue the moratorium on commercial fishing, as well as a need to expand the Sentinel Fishery program for this stock.

In October 1996, the FRCC recommended reopening a limited commercial fishery in 1997 with a TAC set at 6,000t. In addition, the Council also recommended that the fishery be closely controlled and monitored.

In 1998, the Council recommended that a TAC of 5,000t be set to allow for a continued limited commercial fishery of this stock, but that fishing be minimized during peak spawning periods and that fishing not be concentrated on the 1993 year-class. The Council also recommended that the winter fishery on Burgeo Bank should be limited to protect 4RS3Pn stock components.

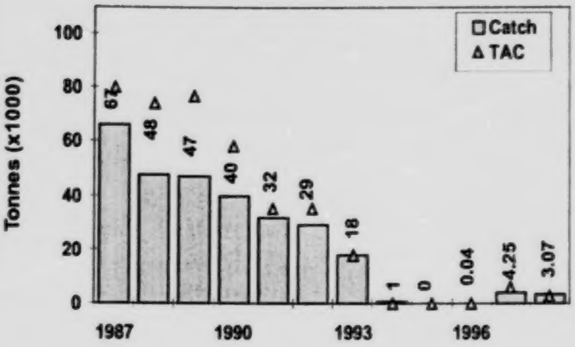
1999 Consultations:

Fishermen reported that catch rates in the sentinel fishery are increasing. Good signs of recruitment were indicated in the hook and line fishery. Fishers in Newfoundland proposed to permanently increase the mesh size in gillnets to 6" from 5.5" in 1999 in order to protect the 1993 year class. A subsequent brief from fishers in the lower North Shore indicated that such a change in mesh size may adversely effect their catch rates. Some fishermen indicated that the use of gillnets should be restricted due to the risk of discarding. The distribution of the stock was reported to be expanding as evidenced by increased catch rates in the most northern areas of the Gulf. The Union conducted a telephone survey which indicated that fishers believed the stock was in better overall condition than their view of the resource in the 1992-93 period. Also they viewed the resource as improving from 1997 to 1998. Fishers reported that overall there is less fish than in the early 1980s. Fishers expressed concern as to whether the

Recommendations:

The FRCC recommends that:

1. the TAC for 1999 be set at 7,500t to allow for a limited commercial fishery in this area;
2. the same conservation measures that applied as part of the CHP in 1998 apply again in 1999;
3. mesh size for gillnets be increased to 6 ";
4. fishing not be concentrated on the 1993 year-class;
5. fishing be minimized during peak spawning periods and on spawning concentrations;
6. strict controls continue to apply in both the shrimp and turbot fisheries to avoid by-catch of juvenile cod;
7. the winter fishery in the Burgeo Bank area should be closed from November 15 to April 15 to protect the 4RS3Pn stock components; and
8. the tagging program be continued.



* 1998 Catch: as of Dec.2/98

period of the winter closure around Burgeo Bank was adequate to protect the 4RS3Pn cod stock. The FRCC was complimented on its recognition of seal predation on cod. Fishers were unanimous that a 10,000t TAC was very responsible and would ensure the continued rebuilding.

ANALYSIS:

The 1999 stock status report indicates:

- The lowest adult biomass was observed in 1994 at 17 Kt, it has slowly increased to reach 55 Kt in 1998. Although there is an improvement, this adult biomass is still much lower than the maximum of 348 Kt observed in 1983.
- The 1993 and 1995 year classes are estimated at 129 million individuals at age 3. This value is close to the historical average. These two year classes are the strongest observed in the 8 last years. The majority of the 1993 year class will spawn for the first time in 1999 and the 1995 year class appears as strong but only a small proportion of them will be mature in 1999 at age 4.
- The directed fishery in 1998 produced landings of 3,000 t with a fishing mortality of 0.11. A harvest of more than 10,000 t in 1999 would be likely to reduce mature biomass.
- Mortality caused by factors other than recorded landings was high in the late 1980s and played a role in the stock's collapse. It is very likely that, during the 1990s, this mortality remained at least twice as high as assumed in assessments before 1998.
- The assessment is based on several indices .

The FRCC makes the following observations in relation to this stock:

Mortality on older age groups is high and may reflect seal predation. Current estimates are that seals are consuming annually 80 million fish age 3+ from this stock. A large part of the population is overwintering in Sub-division 3Ps. The area around Burgeo Bank needs to be closed to fishing during this period. There is near universal agreement among scientists, fishers and industry that this stock is still at low levels compared to its historical levels and potential. Hence the goal for this stock is to allow for modest but sustained growth in abundance, distribution and age structure, while encouraging a limited fishery.

The SSR assessments, based on a newly formulated multi-index model, that includes indexes from offshore and inshore, and the impact of seals on cod mortality. This model indicates that a conservative harvest, wherein there is an 80% probability that the SSB will not decline, is consistent with a TAC of 6,000t. However, there is uncertainty in this approach. In particular, the submitted views of industry and fishermen on both sides of the Gulf suggest that this stock is rebuilding faster and is in better condition than suggested by the SSR.

Industry and fishermen generally believe that a TAC of 10,000t is justified and sustainable. In support of this, fishery catch rates have been strong and alternative interpretations of RV surveys and tagging experiments have suggested somewhat higher biomass levels than suggested in the SSR. Nevertheless, key rebuidling indicators remain depressed. In particular, recruitment and the SSB remain low relative to historical averages and distribution, while improving, has not fully expanded to the historic range.

SENTINEL FISHERY:

In 1998, six sentinel surveys were used in the assessment.

The four fixed gear indices showed similar inter-annual patterns for both gillnets and hook and line. The 1998 catch rates for these gears improved in almost all areas.

The sentinel fishery program using mobile gear began in the northern Gulf in 1994, but it was not until 1995 that the entire offshore stock area was covered. These surveys are conducted twice a year (July and October) using nine trawlers. They carry out stratified random sampling like that done the *Needler*. The gear employed by the nine trawlers was standardized in 1997 by introducing the use of a restrictor cable, which keeps the size of the trawl opening constant throughout fishing operations.

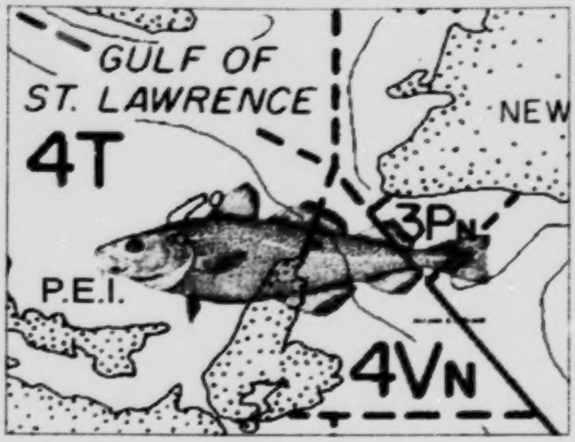
The July abundance index doubled between 1995 and 1997, but remained low in absolute terms. The population abundance estimate declined slightly between 1997 and 1998 for the July surveys. However, the 1995 year class at age three is the most important in the time series. The October index rose between 1995 and 1996, but declined in 1997. The index of the 1998 October sentinel survey is the highest in the time series exceeding slightly the 1996 and 1997 surveys. The major part of the biomass is located in Division 4R. The distribution of cod does not vary significantly between July and October.

The 1993 year class dominated catches during the last five surveys, from age two in 1995 to age four in 1997. However, the 1995 year class was the most abundant in both 1998 mobile gear sentinel surveys at age 3.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator:	stock status improving with extended geographical distribution in coastal areas
Compared to average	
Overall biomass:	lower than average
Spawning biomass:	lower than average but increasing
Recruitment:	near average 1993 and 1995 year-classes; weak 1994 year-class
Growth and condition:	growth improving; condition stable
Age structure:	
Recent exploitation level:	fishery closed 1994-96, 1997 catch of 4,400t , 1998 catch of 3029t

COD - 4TVN



HISTORY OF FRCC RECOMMENDATIONS:

In 1993, due to the dramatic decline in all of the indicators for this cod stock and the poor recruitment prospects, the Council recommended that this fishery be closed at least until June 1994. The fishery was then closed by DFO. Taking a cautious approach, the Council recommended in November 1994 that no directed fishing take place on this stock in 1995. In 1995, as prospects for recovery continued to be bleak, the Council recommended for 1996 that the moratorium on commercial fishing be continued. However, the Council estimated that the stock could sustain a 4,000t catch and that this value could be used as an upset limit for an enlarged Sentinel fishery. In 1996, the calculated spawning biomass (age 5+) was estimated by DFO to be around 110,000t improving but still below the values observed in the mid-eighties when at that time the spawning biomass was estimated to be twice as much. The Council recommended for 1997 a limited reopening of the commercial fishery with a TAC of 6,000t. DFO decided not to follow the FRCCs recommendation Instead, the sentinel fishery was expanded and experimental projects were established.

In March 1998, the FRCC recommended that there be no directed commercial fishery for this stock, and that total removals in the index and sentinel fisheries as well as by-catches not exceed 3,000t.

1999 CONSULTATIONS:

A document was presented in Gaspé by the coalition "MORUE", regrouping fixed and mobile gear fishers as well as academic institutions and social groups. The document explains the current poor situation of Quebec fishing industry since the closures. The document raises doubts about the scientific assessment, pointing out apparent inconsistencies and discrepancies with

RECOMMENDATIONS:

The FRCC recommends that:

1 the stock be reopened for a commercial fishery;

2 the TAC be set at 6,000t;

3 science and industry work together to begin a standardized catch rate time series, in order to build a reliable database;

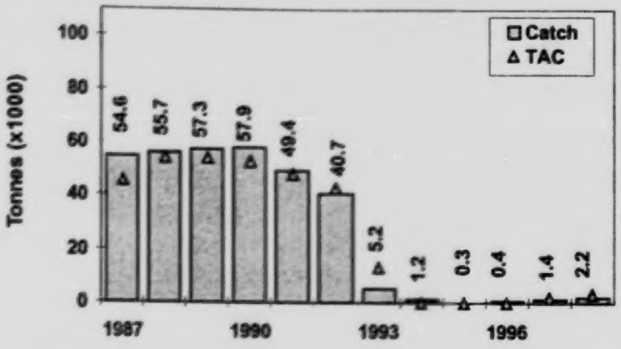
4 actions be taken to protect the 1995 and the 1996 incoming year classes;

5 fishing on spawning concentrations be minimal;

6 the fishery be subject to 100% dock side monitoring;

7 any fishing on the 4T-4Vn cod stock during its over-wintering in 4Vn area should only take place to the extent that there is a high confidence that catch of 4Vn resident stock be minimal. The Department of Fisheries and Oceans is encouraged to research the conditions by which this might be achieved; and

8 the sentinel fishery be pursued, and a protocol to monitor the recruitment in the inshore areas be implemented as a part of it.



* 1998 Catch: as of Dec.2/98

fishers' observations. The group feels that a new type of cooperation is needed between science and industry. The coalition feels that the fishery should be reopened in 1999 and a TAC of about 10% of the calculated biomass (i.e. 9,000t) is realistic and would not prevent the recovery of the stock. The fishery should be well controlled and monitored. It was said, during consultations that the present geographical distribution is not an indication of stock abundance as it may be due to normal cycles or to environmental conditions. Some concerns were raised regarding the too numerous conservation measures that prevent the "normal" prosecution of fisheries.

The same views about the stock status and the recommended TAC were shared by the mobile fishers in the Magdalen Islands. It was added that the numerous types of fisheries (i.e. sentinel, index, recreational) become confusing and that it would be better to consolidate them in a single true commercial fishery (it was felt that it is better to have a controlled open fishery than an uncontrolled closed fishery). The mobile fleet activity has changed, having been severely reduced and using more selective gears: it is acting now in more of a conservation manner and is certainly not as destructive as in the past. It was also recommended that the FRCC should have a global perspective; should be consistent across areas and should not step into gear conflicts. In Québec, fishers expressed a great concern about the respect of their historical share.

The Association des pêcheurs de poisson de fond acadiens presented a calculation derived from Science data and argued that the biomass has increased much more than described by the SSR and that a TAC of 9,000t would still allow a significant increase. The proposal was to implement a well controlled and monitored commercial fishery with an interim quota of 6,000t, with a mid-season review based on catch rates that could allow an extra 3,000t TAC. A suggestion was made that the stock could be made of two components, one moving west south along Prince Edward Island shore and the other moving west through a more northern route: the first one would have recovered while the second one would remain in bad shape.

In Cape-Breton, fishers felt that the stock could sustain a 6,000t commercial fishery. As in other areas, fishers reported large amounts of cod that prevent the normal fishing activities on other stocks. Unusual, historically high, by-catches are reported in lobster traps.

A common view is that the index fishery, as prosecuted in 1998, is no more acceptable as it is seen as a disguised commercial fishery as it was unable to provide the expected data.

Different views of the stock status was expressed by fixed gear fishers. No cod is showing up around the Gaspésie coast line and traditional fishing grounds east of Gaspé are still empty of cod. Fixed gear fishers groups generally feel that the cod stock is still in poor shape and that we should move very cautiously, with a different more ecological approach (i.e. using fixed gear only). The catch limit should be kept at 3,000t, and should certainly not exceed 5,000t.

A general feeling was that the sentinel fishery provides useful information and that the time series should be continued.

ANALYSIS:

The 1999 Stock Status Report indicates that:

- The closure of the cod fishery in the southern Gulf of St. Lawrence in September 1993 stopped the rapid decline in abundance and biomass of the stock. Since the fishery closure in 1993, the stock has remained low.
- The recruitment produced in the early 1990s has been well below the historical average. However, there are now indications that recruitment is improving; the 1996 year-class is about average.
- Estimates of total mortality from research and sentinel surveys indicate that the natural mortality rate of this stock remains higher than the historical estimate of 0.2. Natural mortality is estimated to be in the range of 0.4 to 0.5.
- The geographical distribution is still a concern as about 45 % of the stock is now concentrated east of Magdalen Islands, compared to 10 to 25% in the seventies.

- Stock projections indicate a 5 to 6% expected improvement in spawning stock biomass in 1999 if there is no fishing.
- The spawning stock biomass could increase by 10% in 2001 provided that the 1996 year-class continues to be about average and catches in 1999 and 2000 are near the 1998 level.

The FRCC notes that the scientific assessment in 1999 is showing more positive signs than in the previous year. The prospect of a stock biomass increase exists. The year classes born in 1995 and, especially, in 1996 are stronger and near the level of the long term annual average recruitment. The Council feels strongly that those classes should be protected as they will contribute to the recovery of the stocks. The FRCC remains concerned about the very low abundance of the 1994 year class that will have a significant effect in 1999. The FRCC tries to reconcile the scientific views, showing a marginal increase of the spawning stock biomass in 1998, as in the previous years, and the perception of the fishing industry, which provides non quantitative but somewhat convincing evidence of a larger amount of fish. It is recognized that the stock status has not yet recovered, however it is recognized that some room exists to increase the catch level. According to the SSR, a catch of 6,000t would maintain the stock at its current level. Some members of the fishing industry feels that a catch up to 9,000t will not prevent an increase in the spawning stock biomass. The FRCC also considers that the biomass remains at a low level and that its increasing rate remains low as well, due to the current low productivity of the stock. The FRCC accepts that the catch level may be increased but considers that a cautious approach is still needed and should be maintained. The Council feels that a TAC of 6,000t can be accepted, as it represents the maximum acceptable level according to the scientific assessment, while permitting the orderly prosecution of a limited commercial fishery. The FRCC recognizes the current depressed level of the stock and the possibility of decline. It feels that no major changes of the TAC are likely to occur in the near future.

As a general approach, the FRCC is concerned about fishing on concentrations that are comprised of more than one stock, particularly when one of those stocks is a relatively depressed state. This concern applies clearly to the winter fishery in the 4Vn area, as a fishery may then capture a significant amount of the local resident stock, which is in a collapsed state.

SENTINEL FISHERY:

The sentinel fishery was implemented in 1994. It was carried on in 1998 with the same protocol as in 1997, using longlines, trawls and seines (mobile gear with and without a liner in the codend in order to get recruitment indices). A total of 630t were caught in 1998 from 539t in 1997. Overall, few changes are noticed since the previous years. Standardized longlines catch rates declined in 1998, with an average value close to the 1995 one, while mobile gears without a liner (seine and trawl) catch rates increased slightly. That increase is considered to be due to the growth of older animals that provide higher catch rates in weight compared to numbers. The geographical distribution provided by the sentinel survey was similar to previous years and to the scientific survey: fish was scarce along Gaspé area, and the abundance was significantly lower in the western part of the Gulf than in the eastern part, especially between Prince Edward

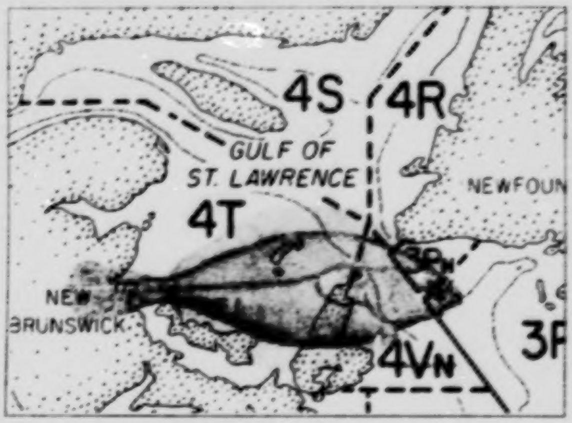
COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator:	stock is stable but at a very low level
	Compared to average
Overall biomass:	the total number of fish has increased by 14% between 1998 and 1999, but remains below long term average
Spawning stock biomass:	stable at low level but extremely fragile to increased natural mortality; growth, not recruitment, maintaining stability
Recruitment:	below average
Growth and condition:	fish improving in weight at age from very low levels and its physical condition remains stable with respect to 1996
Age structure:	affected by poor recruitment
Distribution:	below average
Exploitation level:	no directed commercial fishery since 1993

Island and Cape Breton. Size frequency distributions show that the 1993 and 1994 year classes are poor while and that 1995 and 1996 year classes appear to be more abundant, which is consistent with the scientific survey.

In 1998, an index fishery program was implemented, following the FRCC's recommendations. This program intended to simulate commercial fisheries, with a minimal quota and under strict supervision, and was expected to provide additional information on stock abundance, on geographical distribution and on juvenile distribution and abundance. About 1221t were caught out of that fishery. While the information may be considered useful as a complement, the informative value is questioned compared to other programs. This may be due to the late departure of the program but also to other factors. For instance, most of the activities tool place on high density locations, which does not add to the current knowledge. Scientists, managers and fishers remain skeptical about the interest of such a program in comparison of other programs.

AMERICAN PLAICE - 4T



HISTORY OF FRCC RECOMMENDATIONS:

The Council recommended the TAC of 5,000t in each of 1994 and 1995, and measures to protect small fish. For 1996, due to indications that the biomass was at the lowest level observed, the Council recommended a reduction in the TAC to 2,000t. It also recommended continuation of efforts to minimize the capture and discarding of small fish. For 1997, based on fishers' observations of higher catch rates despite the use of larger mesh size off eastern P.E.I., and in consideration that 1996 fall survey was similar to that undertaken in 1995, the Council recommended an increase in the TAC to 2,500t. The Council reiterated its call to strictly enforce size limits and also recommended that measures be taken to limit the redirection of effort from other fisheries.

In 1998 the Council recommended the TAC for this stock be lowered to 1,500t, and that mandatory hailing system and dockside monitoring be maintained. The Council further recommended that DFO convene discussions with industry to ensure no increased effort in eastern 4T from 1997 levels, to explore an increase in the minimum mesh size to optimal levels for all gears, to establish the use of indexed vessels, to establish proper CPUE indices for future stock evaluation, and to launch a joint DFO/Industry research survey using commercial vessel(s). It was further recommended that DFO establish measures to ensure that effort was reasonably dispersed and not concentrated on stock components.

1999 CONSULTATIONS:

Most of the comments came from the consultations in Port Hawkesbury. The major concern is related to the research vessel *Alfred Needler*, which is perceived as inadequate for groundfish surveys, in general, and for flat fish surveys, in particular. Criticism was raised regarding the lack of experience of the crew and the type of bottom trawl being used, that is not suitable for flat fishes. A strong need was expressed for a survey made by a commercial fishing vessel, in parallel to the Needler's survey, in order to test the validity of the scientific assessment. A proposal was made for such a survey.

RECOMMENDATIONS:

The FRCC recommends that:

1 the total removals from the stock should be set at 2000t in 1999;

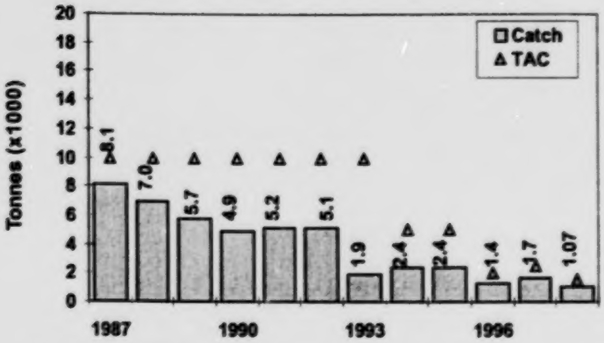
2 these total removals should be maintained at the current precautionary level in the future until the question of discrepancies between science and industry is resolved;

3 a research cruise carried out by commercial vessels must be implemented in order to assess the flat fish catchability of the *Needler's* survey. The organization of such a survey should be discussed between science and industry;

4 research on selectivity should be pursued. Once the selectivity curve is defined, the proper mesh size must be implemented in order to effectively protect the smaller fish;

5 the amount of fish needed for the survey and for the selectivity research should be taken out of the recommended total removals; and

6 scientific research be pursued to develop a view of stock migration pattern for this species in and out of the Gulf of St. Lawrence.



* 1998 Catch: as of Dec.2/98

Fishers feel that the stock is in a much better shape as described by the stock status report. High catch rates are still experienced while the mesh size of the trawls have been voluntarily increased to more than 155mm (sometimes as high as 170mm). Catch rates have increased in some areas. The catch is not reflective of the abundance as numerous closures occurred in the mobile fleet fishery due to the high by catches in the witch flounder fishery. Fishers requested a substantial increase of the TAC varying from 500 to 2,000t.

Concerns were raised in Moncton about the numerous catches of small plaice not suitable for the market, and the present minimal legal size was questioned. The catch of sub-legal sized fish remains an issue and more work on selectivity of gears is requested.

ANALYSIS:

The 1999 update to the Stock Status Report states that:

- Stock abundance and recruitment remain poor.
- Year class remains at a low level.
- The stock is concentrated in eastern 4T, which makes it vulnerable to excessive exploitation.
- Chances for conservation would improve if catches continue to be kept well below the 2,000t level.

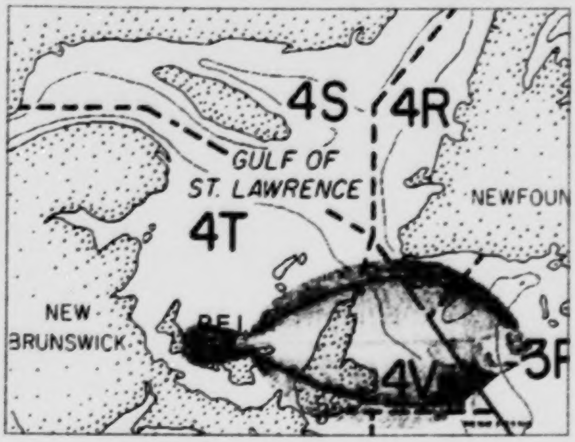
The FRCC is not able to reconcile the conflicting views between the scientific assessment, which describes a very bleak situation for the stock, and the industry sector, which feels that the stock is in good health. The negative signals provided by the scientific assessment cannot be ignored. However, the FRCC feels that information coming from the industry allow for some increase in the exploitation rate. The issue of the discrepancies between science and industry views must be addressed in order to provide a widely accepted perception of the stock status. Unless this issue is resolved, it is unlikely that the FRCC will be in a position to recommend any further changes in the near future.

The Council remains concerned about the catch of under-sized fish.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator:	population abundance remains low and recruitment remains poor; decline arrested in 1998 ; may be improving according to the fishing industry
	Compare to average
Overall biomass:	Still well below long term average, slight improvement in 1998 after 20 years of constant decline since the late 1970s highs (however abundance is the second lowest in the trawl survey time series); different views are expressed by the fishing industry
Spawning biomass:	cannot be quantified
Recruitment:	still well below average as indicated by the number of fish smaller than commercial size in the scientific survey
Growth and condition:	no indication; discards of under-sized fish remains a concern
Age structure:	no indication
Distribution:	abundance remains stable in the eastern part of the Gulf of St. Lawrence; constant decline in the western part
Recent exploitation level:	1998 catch at 1100t from a TAC of 1500t; by-catches of other species limited landings

WITCH FLOUNDER - 4RST



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council recommended that the TAC for the stock unit 4RS in 1994 be set at 1,000t as a pre-cautionary measure, and that, pending clarification of stock boundaries, catches of witch flounder in 4T be monitored closely. For 1995, the Council recommended that the stock unit for this species be amended to include 4T, and that the TAC be set at 1,000t for this expanded area in 1995. In its reports for 1996 and 1997, Council recommended that the TAC of 1,000t for 4RST witch be maintained. All of these TAC recommendations were implemented as stated.

For 1997, the FRCC also recommended that measures be taken to harmonize mesh sizes used for this species over the entire stock area.

The Council recommended in 1998, that the TAC for this stock be lowered to 800t to guard against further declines and enhance prospects of re-building. It was also recommended that information available concerning spawning times and areas for this stock be compiled and assessed, with a view to introducing protective measures. An increase in mesh size was recommended.

1999 CONSULTATIONS:

Most comments came from the Port Hawkesbury consultations. The major concern was related to the research vessel *Alfred Needler*, which is perceived as inadequate for groundfish surveys, in general, and for flat fish surveys, in particular. Criticism was raised regarding the lack of experience of the crew and the type of bottom trawl being used, that is not suitable for flat fishes. A strong need was expressed for a survey made by a commercial fishing vessel, in parallel to the Needler's survey, in order to test the validity of the scientific assessment. A proposal was made for such a survey.

Considering the stock status, fishers felt that the stock is improving. High catch rates were experienced.

RECOMMENDATIONS:

The FRCC recommends that:

1 the total removals for 1999 be maintained at 800t;

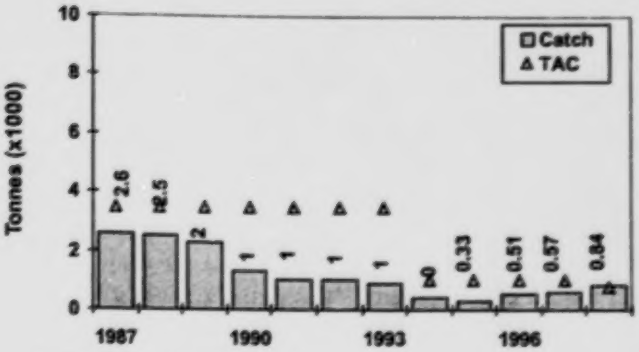
2 these total removals be maintained in the future until the question of discrepancies between science and industry is resolved;

3 a research cruise carried on by commercial vessels should be implemented in order to assess the flat fish catchability of the Needler's survey. The organisation of such a survey should be discussed between science and industry;

4 research on selectivity should be pursued. Once the selectivity curve is defined, the proper mesh size must be implemented in order to effectively protect the smaller fish;

5 the amount of fishes needed for the survey and for the selectivity research be taken out of the recommended total removals; and

6 scientific research be pursued to develop a view of stock migration pattern for this species in and out of the gulf of St. Lawrence.



* 1998 Catch: as of Dec.2/98

Significant abundance of witch flounder was also reported along the eastern shore of Newfoundland. Along Cape Breton coast, the TAC was caught after a short period of time, which prevented the prosecution of the American plaice fishery at the end of the season. A TAC between 1000 to 1200t was recommended.

Concerns were raised about new fishers, with no history in the fishery, beginning to direct for witch flounder.

ANALYSIS:

The 1999 update to the DFO Stock Status Report indicates that;

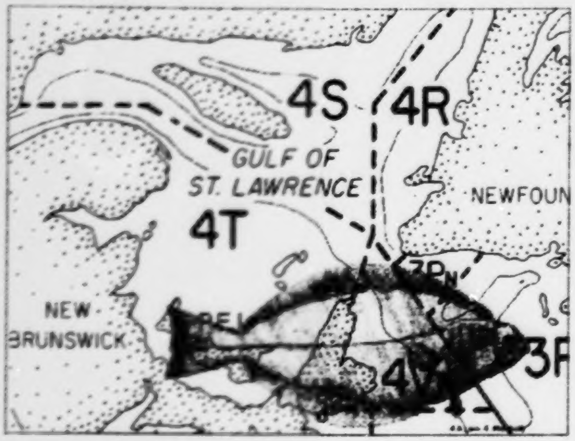
- Although relatively abundant in eastern 4T, biomass as a whole has been at a low level since 1993.
- Recruitment has remained fairly constant throughout 1990s (except for fluctuations in 1993 and 1994) and has tended to be higher than in the late 1980s.
- Improved recruitment appears to be needed for stock rebuilding.

The FRCC is not able to reconcile the conflicting views between the scientific assessment, which describes a very bleak situation of the stock, and the industry sector, which feels that the stock has improved. The issue of the discrepancies between science and industry views must be addressed in order to provide a widely accepted perception of the stock status. The FRCC, however, feels that the stock remains highly vulnerable and that the positive signs are scarce. The observation that the stock does not show significant signs of recovery while the recruitment is at one of the highest levels ever observed is of great concern. The Council thinks that a strict conservation approach has to be maintained over a certain period of time in order to help to the stock recovery.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator:	population still at low level and not rebuilding despite high recruitment ; fishing industry indicates improvement
	Compare to average
Overall biomass:	remains at the lowest levels observed
Spawning biomass:	still a low level
Recruitment:	constant throughout the 1990s; higher than in the late 1980s
Growth and condition:	no information
Age structure:	no information
Distribution:	1998 biomass in the eastern 4T exceeded the 1987-1990 average; declined in the western 4T and in 4R and 4S
Recent exploitation levels:	low landings in recent years due to low TAC; TAC exceeded in 1998

GREENLAND HALIBUT - 4RST



HISTORY OF FRCC RECOMMENDATIONS:

In 1993 and in 1994, the FRCC recommended the TAC to be set at 4,000t. In 1995, considering the declining abundance, the Council recommended to decrease the TAC to 2,000t, along with measures to allow young fish to mature. The same TAC was set in 1996. In 1997, according to positive indicators regarding the biomass and the recruitment levels, FRCC recommended a raise of the TAC up to 3,000t.

In March 1998, the FRCC recommended that the TAC for this stock be raised to 4,000t, and that measures regarding the protection of juveniles be maintained.

1999 CONSULTATIONS

Fishers reported that in their view the stock was at the long term average. Reported that Nordmore grate in the shrimp fishery had a favourable impact on the turbot resource.

ANALYSIS

The 1999 Stock status report indicates that:

- The catches per unit of effort (CPUEs) of Quebec gillnet fishers increased in 1998 and the summer fishing season was short. In Division 4R, however, the limited information available on catch rates indicates a drop in CPUEs and a slightly longer summer fishing season.
- The biomass index from the DFO's research survey has shown an upward trend since 1990. The highest estimates were recorded in the last three years. The biomass indices of the sentinel fishery surveys conducted in July and October have been rising since 1995.
- The juvenile abundance indices from the research surveys show that the 1995 and 1997 year-classes are the largest since 1990.
- Because of the rapid growth of the 1995 year-class, the average size of these fish will fall slightly below the minimum size limit (44 cm) and may well lead to large catches of fish under 44 cm in 1999.

The FRCC believes that this stock is near its long term average and does not expect the TAC to fluctuate widely in the near future.

RECOMMENDATIONS:

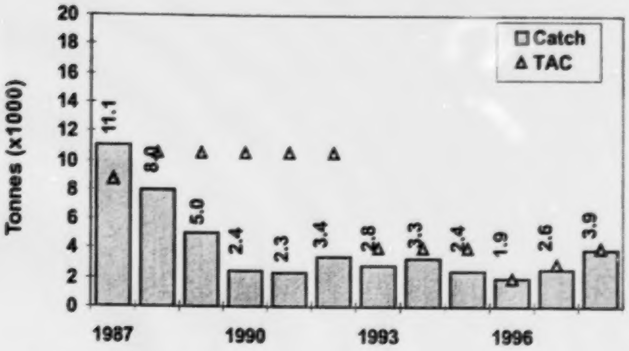
The FRCC recommends that:

1 the 1999 TAC should be raised to 4500t;

2 measures regarding the protection of juveniles, such as small fish protocols, mesh-size and Nordmore grate be maintained;

3 further scientific research be pursued in order to develop a more precise view on stock delineation and migration patterns; and

4 continue with the 6" mesh size in gillnets uniformly throughout the Gulf.

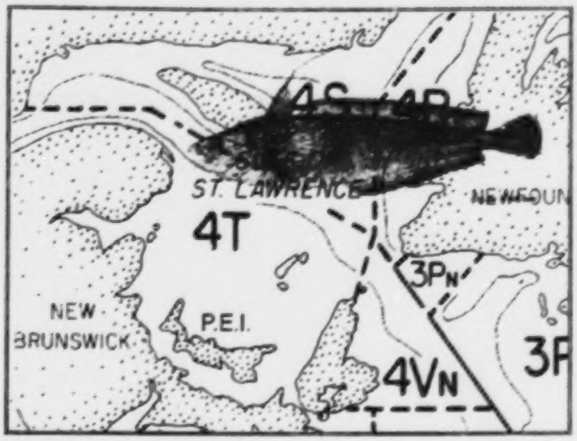


* 1998 Catch: as of Dec.2/98

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator:	Stock still rebuilding
	Compared to average
Overall biomass:	Increasing since 1990
Spawning biomass:	unknown
Recruitment:	1995 and 1997 year classes good.
Growth and condition:	good
Age structure:	improving
Recent exploitation level:	unknown

WHITE HAKE - 4T



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council recommended that the TAC be reduced to 2,000t for 1994 as a precautionary measure. Due to the historically high incidence of small fish in the catch, the Council also recommended that the measures introduced in 1993 to protect small fish be continued. It was also recommended that key areas and times of spawning activity for this stock be delineated and that, if feasible, measures be taken to establish closures during spawning areas/periods.

In November 1994, as there was no change in the abundance estimates (which remained at about half the level of 1992), the Council recommended that there be no directed fishing for 4T white hake and that by-catches be kept to the lowest possible level. In 1995, due to continued concerns over low abundance and with the indications of weak incoming recruitment, the Council recommended a continuation of the moratorium on directed fishing in 1996. For 1997, the Council recommended there be no directed fishing but allowed for a 500t bycatch.

In 1998, the FRCC recommended there be no directed fishing for 4T white hake and that bycatch protocols be applied when prosecuting other fisheries. The Council also recommended that work be undertaken to determine if this is a resident Gulf stock or if this is a component of the Eastern Scotian Shelf stock.

1999 CONSULTATIONS:

Comments came exclusively from the Port Hawkesbury consultation. Fishers experienced very high catch rates in the sentinel fishery taking place in St. Georges Bay. Great concerns are raised regarding the high level of by-catch that limits the other fishing activities in that area. It is felt that the scientific survey cannot properly assess the recruitment of the population. A minimal TAC of 400t for St. Georges Bay is requested in order to allow some directed fishery and the normal prosecution of other fisheries. This fishery would be carried on by longlines only with a maximum of 2000 hooks. A 25% bycatch allowance for mobile fleet was requested.

RECOMMENDATIONS:

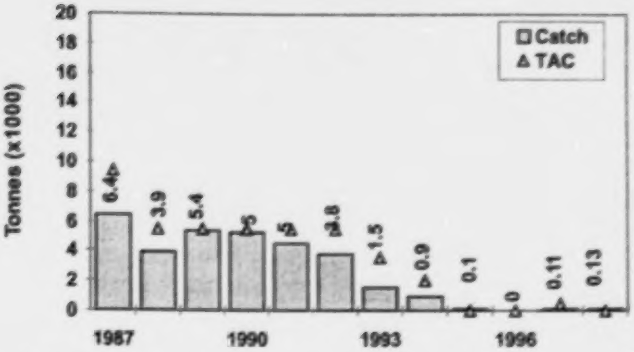
The FRCC recommends that:

1 there be no directed fishery for 4T white hake in 1999;

2 there be a restrictive by-catch fishery only; measures should be implemented to minimize by-catches of this stock in all fisheries directed towards other species. In addition, consideration should be given by DFO in consultation with industry, to the establishment of incremental conservation measures, including closed areas where higher by-catches are encountered, closed seasons when higher by-catches are encountered,

3 the substantive by-catch in other fisheries occurring in St. Georges Bay may result in significant white hake mortality and should be avoided; and

4 work be undertaken to determine if this is a resident Gulf stock or if this is a component of the Eastern Scotian Shelf stock and scientific research be pursued to develop a view of stock migration pattern for this species in and out of the Gulf of St. Lawrence.



* 1998 Catch: as of Dec.2/98

ANALYSIS:

The 1999 update to the Stock Status Report indicates that:

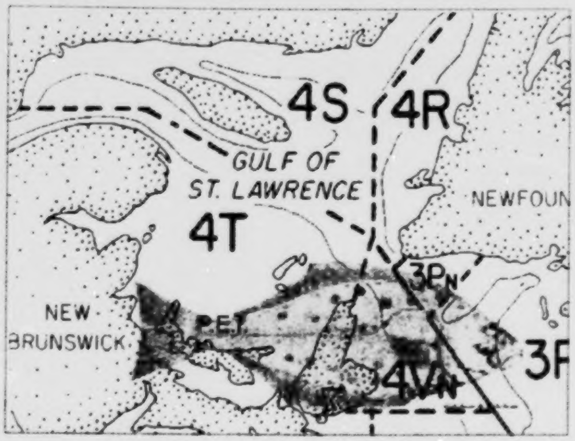
- Resource remains near its lowest level since the first quota was put in place in 1982.
- Mean weight of fish caught per tow (all ages) remains low.
- Abundance of commercial size fish (over 40 cm) remains low.
- Considering the low abundance and indications of weak incoming recruitment over the next couple of years, any recovery of this stock will occur slowly.

The FRCC remains heavily concerned by the status of the resource, which remains at very low levels and which does not show evidence of recruitment. The geographical contraction of the resource in a very small area may be the primary reason for the high catch rates experienced there. The relationship with the stock present in the Eastern Scotian Shelf remains a major issue.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator:	still in a very depleted state; not likely to recover in the near future
	Compare to average
Overall biomass:	remains near the lowest historical levels
Spawning biomass:	very low
Recruitment:	young fish abundance well below the numbers observed in 1995 and 1996 surveys
Growth and condition:	no information
Age structure:	contraction of the size structure in 1998 compared to the 1984-1997 average
Distribution:	fish biomass mainly concentrated in St. Georges Bay and along Cape Breton; the question of the links with the population of the northern Scotian Shelf still debated
Recent exploitation level:	no directed fishery since 1995.

ATLANTIC HALIBUT - 4RST



HISTORY OF FRCC RECOMMENDATIONS:

Since 1993, the FRCC has recommended a constant TAC at 300t. In 1995, the Council also recommended that the release of fish of size under 81cm be mandatory.

In 1998, the Council further recommended that landings be properly monitored and small fish protocols be effectively enforced, and measures to protect juvenile halibut and to reduce by-catches be maintained and strictly enforced.

1999 CONSULTATIONS:

Fishermen were tagging halibut. Seems to be many small halibut in certain areas but not many large halibut as in years past.

ANALYSIS:

The 1999 Stock Status Report indicates that :

- Since 1996, total landings of Atlantic halibut have more than doubled and are now close to the precautionary TAC of 300 t; however, they are well below the values of 1,000t and over regularly recorded during the first half of the century.
- During the same period, the fixed gear fleet has steadily increased its contribution to total landings, reaching over 99% of the total in 1998. More than 90% of the fixed gear catches are made by longliners.
- The length distributions of fish caught with fixed gear have always been quite broad, compared to those computed for catches made by the mobile gear fleet. Since 1995, this fleet's catches have consisted almost exclusively of individuals under 100 cm in length.

RECOMMENDATIONS:

The FRCC recommends that:

1 the 1999 TAC be set at 350t;

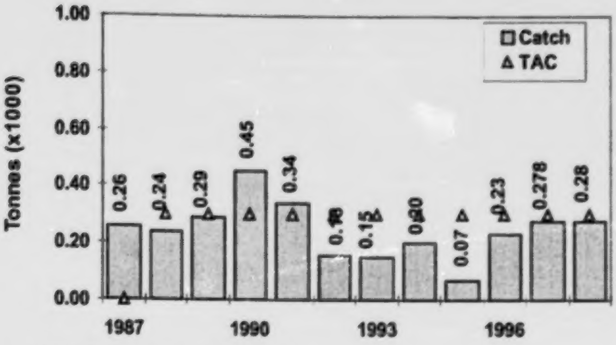
2 the release of fish smaller than 81cm be enforced for both commercial and recreational fisheries;

3 efforts be made immediately to determine the survival rates of 81 cm and smaller fish;

4 DFO, in conjunction with industry, ensure that the necessary information is recorded in log books so that a CPUE index can be developed and that tagging studies as well as research surveys be implemented so as to gain a better understanding of the status of this stock ;

5 measures to protect juvenile halibut and to reduce by-catches should be maintained and strictly enforced; and

6 DFO Science investigate the biological link of Atlantic halibut in 3Pn to adjacent stocks in 4RST and 3NOPs4VWX5Ze. 3Pn is not currently included as part of the existing management units. Once this assessment is done, DFO management should then properly manage the removals from this area.



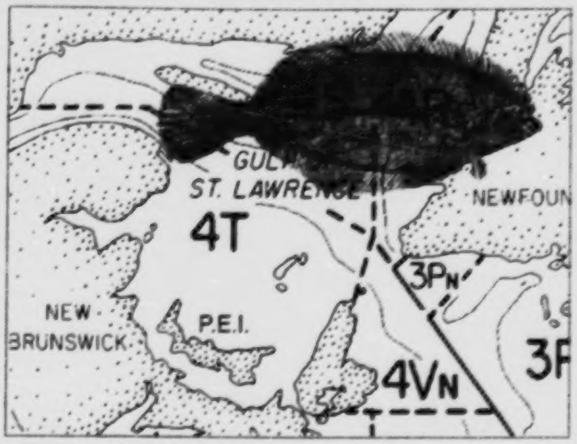
* 1998 Catch: as of Dec.2/98

- Although catches of halibut less than 81 cm long, which is the minimum size limit for the fishery, have declined over the past few years, undersized specimens are still present in catches, notably in mobile gear landings and in gillnet catches. In gillnet catches, halibut under 81 cm in length account for 50% of the specimens sampled.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator:	stock at low level
	Compared to average
Overall biomass:	stable at low level
Spawning biomass:	unknown
Recruitment:	some recruitment as per catch of immature fish
Growth and condition:	not available
Age structure:	no reliable indicator; wide size range present
Recent exploitation:	TAC at 300t since 1991. by-catches of juveniles remain a concern and high mortality of released fish is of concern

WINTER FLOUNDER - 4T



HISTORY OF FRCC RECOMMENDATIONS:

Prior to 1996, when a precautionary quota of 1,000t was introduced, no TAC was established for this stock. In its 1993 through 1995 reports, the Council recommended that landings of this species be closely monitored, that the catches of small fish which had been prevalent for this species be rigorously addressed, and that directed fisheries for winter flounder be allowed only if and where by-catches of Atlantic cod could be kept at the lowest possible level.

The Council's recommendation in 1997 was that overall catches in that year not be allowed to exceed the longer term average of reported landings. Earlier recommendations regarding the need to report landings accurately, minimize juvenile mortality, and control by-catches of other species were reiterated for 1997. Council also requested that the question of stock components be addressed as part of the scientific program for this species.

In 1998, the Council recommended that overall catches not be allowed to exceed 1,000t, through the maintenance of a precautionary TAC, and that strong measures be maintained to guard against over-fishing of localized concentrations. The FRCC further recommended DFO Science and industry address the practicality of establishing sub-area quotas within the 4T stock for 1999.

1999 CONSULTATIONS:

Little discussion on the stock status occurred during the consultation. In Port Hawkesbury it was felt that nobody knows what the stock status is. Questions were raised about the size structure as the scientific survey shows a constant decline of the mean size over the past decade while it is more or less constant in the commercial fishery. It was also said that commercial catch rates are not a good indicator of abundance due to the various mesh sizes being used. The decline in biomass observed in some areas may be due to migration patterns, as the increasing abundance of American plaice may force the winter flounder to stay inshore. It is felt that the stock is not in as bad shape as described by the SSR. Several people raised the issue of the delineation of stocks units. In the Magdalen Islands, it was suggested that the population is composed of several "micro-stocks" that should be "micro-managed". A fixed gear fisher suggested that 130mm mesh size is too small and should be banned.

ANALYSIS:

The 1999 DFO Stock Status Report indicates that:

- Winter flounder in 4T probably comprise several stock units. The information base for assessing this resource remains limited.

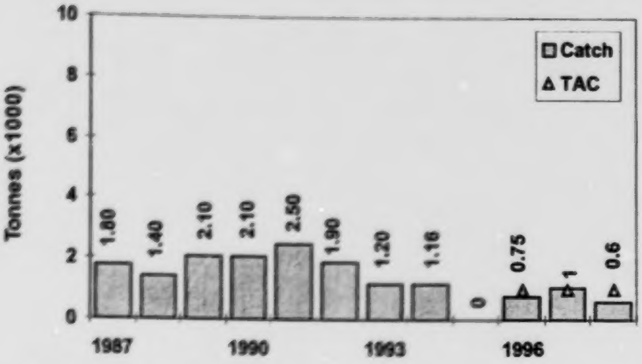
RECOMMENDATIONS:

The FRCC recommends that:

1 the TAC be capped at 1,000t;

2 discussions begin this year between science, management and the industry to implement local management measures that should be in place no later than the year 2000; and

3 appropriate mesh size be part of the management measures for each area.



* 1998 Catch: as of Dec.2/98

- Commercial catch rates calculated from trawlers in unit area 4Tg since 1991 peaked in 1994, declined to 1997, and remained at the same level in 1998. Catch rates from the single vessel catching winter flounder in the sentinel program in 4Tg indicate increased catch rates in 1998.
- DFO groundfish surveys suggest that winter flounder abundance is below average throughout 4T relative to estimates since 1971. The size composition has shifted to smaller fish, mean weight has declined and analyses indicate relatively high fishing mortality.
- Through consultations and telephone surveys of fishers, stakeholders appear to view the status of this resource favorably, particularly in 4Tg. Industry views the DFO groundfish survey with skepticism, as it does not provide adequate coverage of inshore winter flounder habitat and fails to indicate recruitment.

The FRCC notes that winter flounder is a sedentary species, year round resident, and the stock is certainly made up of a number of localized components. An indication of this comes from the survey that shows different trends between areas: around the Magdalen Islands, the survey index shows a decline since the beginning of the 80s with some marginal increase since the early 90s; east of Prince Edward Island, the index is more or less constant, with some fluctuations, over the past 15 years; around the Miramichi, it shows high fluctuations with a general increasing trend; in the Chaleur Bay, the index is highly variable with no particular trend.

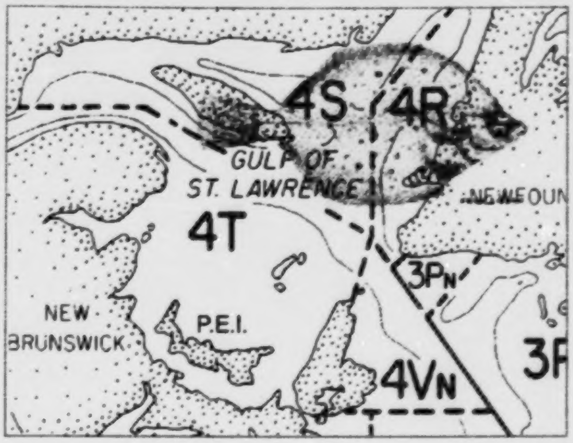
The data provided shows several warning signals. The decline of the mean size observed in the scientific survey cannot be totally ignored; the relative fishing mortality is increasing since 1995 and the catch rates in the mobile fleet shows a decreasing trend since 1994. Several uncertainties exist. The survey only covers a small part of the overall distribution of the species and is recognized not to assess the recruitment effectively. The efficiency of the Alfred Needler survey to properly assess flat fishes is widely questioned.

The selectivity of gears in use remains a concern.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator:	overall abundance below average; varies between regions
	Compared to average
Overall biomass:	below average; catch rates stable since 1997, increased in some regions
Spawning stock biomass:	no information
Recruitment:	no information
Growth and condition:	varies by regions
Age structure:	mean size decreased in the survey; stable in the commercial catches
Distribution:	population likely to composed of several sub-components
Recent exploitation level:	relative fishing mortality increased significantly since 1995

YELLOWTAIL FLOUNDER - 4T



HISTORY OF FRCC RECOMMENDATIONS:

The Council first commented on this stock in 1998. At that time the FRCC recommended that a catch level not exceeding 300t be set for the Magdalen Islands directed fishery. It was also recommended that a small fish protocol be formally established for this fishery, and that measures be established for the collection of biological data to give a better assessment of this stock.

1999 CONSULTATIONS:

No particular comments were made during the consultations

ANALYSIS:

The 1999 Stock Status Report indicates that:

- Catch rates of commercial vessels show little change from 1994 to 1998.
- The mean weight/tow for all of 4T in the DFO research vessel survey remained relatively stable from 1985 to 1996, then decreased to the two lowest points since 1984.
- Research vessel survey data show relatively small modal (most common) lengths and small proportions of large fish throughout 4T in both 1997 and 1998.
- Relative fishing mortalities at length for 1997 are much higher than for 1995-1996 and 1998.

The FRCC notes that yellowtail flounder was traditionally fished for bait in the Magdalen Islands. A commercial fishery started in 1997, leading to landings reaching 800t. This amount resulted in a measurable decline in the biomass close to the Magdalen Islands, as indicated by the 1997 research survey. The market was not as interesting in the subsequent years. The pressure for the species was then relaxed which resulted in a significant decline in the relative fishing mortality.

The FRCC is concerned by the constant decline in the mean size of fish. It also notes that the validity of the current management unit is unclear as more than one stock may exist.

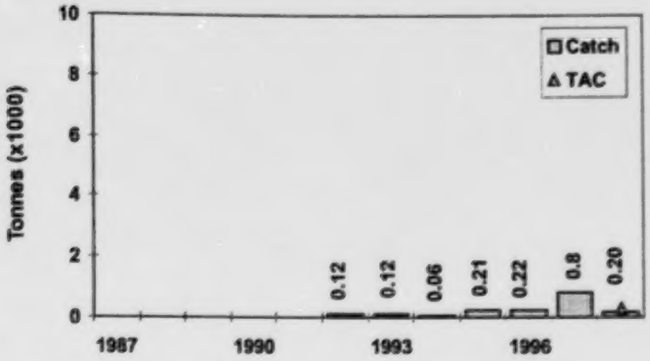
RECOMMENDATIONS:

The FRCC recommends that:

1 a TAC of 300t be set in 1999 for the Magdalen Islands area;

2 in other areas, discussions between management and industry be implemented to define what is the appropriate by-catch level, over and above the recommended TAC, in order to allow the normal prosecution of other fisheries; and

3 discussions start this year between science, management and the industry to analyse the validity of the current management unit and to implement local management measures that should be in place no later than in the year 2000.

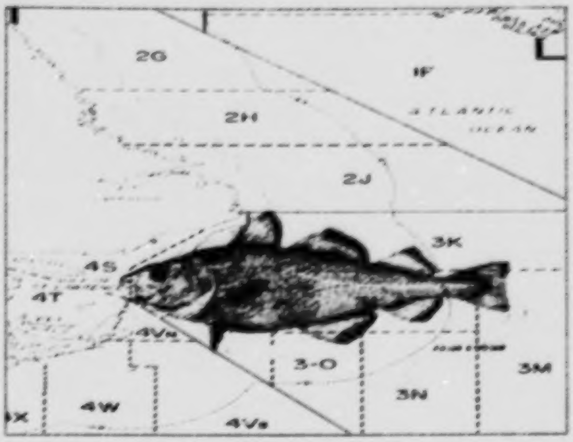


* 1998 Catch: as of Dec.2/98

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator:	population declined close to the Magdalen Islands after the high landings of 1997
	Compare to average
Overall biomass:	declined since 1997 around the Magdalen Islands; stable at average level for the whole 4T
Spawning biomass:	likely to be stable at average level
Recruitment:	abundance of small fish increased in the 1998 survey
Growth and condition:	no information
Age structure:	constriction of the size distribution
Distribution:	fish localised around Magdalen Islands and around Prince Edward Island; the existence of several sub-components is debated
Recent exploitation:	low in 1998, same as in 1995 and 1996

COD - 2GH



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council recommended that the 1994 TAC for 2GH cod be set at 1,000t as a precautionary measure. The consultations held in 1994 confirmed that there had been very few cod in 2GH in recent years and led the FRCC to recommend, in November 1994, that any fishery for cod in 2GH be carried out within the framework of a scientifically coordinated test fishery. The Council recommended that a nominal amount of 200t be provided for this purpose. In 1996, 1997 and 1998 the FRCC recommended no directed fishing take place on this stock and cooperative industry science surveys should be encouraged.

1999 CONSULTATIONS:

There were no comments received from fishermen specifically about 2GH cod.

ANALYSIS:

The 1998 DFO Groundfish Overview indicates that:

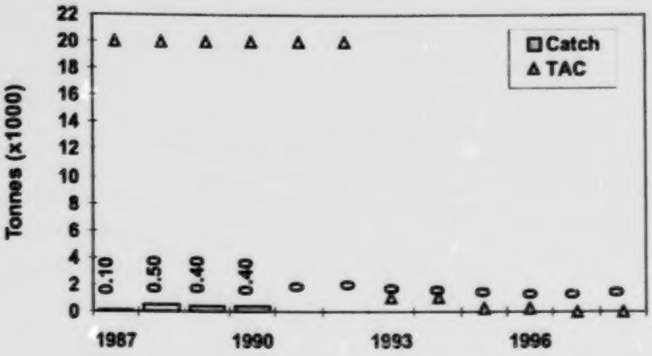
- The catch has been negligible since 1990.
- The survey conducted in 1997 detected very few fish.
- The status remains unknown but abundance is assumed low.

There is limited information on this stock and no new information since the 1998 DFO Groundfish Overview. There are some by-catches reported by observers in the shrimp fishery, although the use of the Nordmore grid is intended to reduce this.

RECOMMENDATIONS:

The FRCC recommends that:

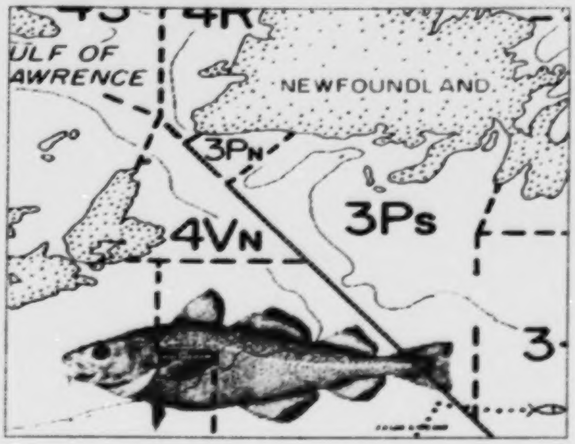
1 there be no directed fishery on this stock.



COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator :	very low, status unknown
	Compared to average
Spawning biomass:	unknown
Total biomass:	unknown
Recruitment:	unknown
Growth/Condition:	unknown
Age structure:	unknown
Distribution:	unknown
Recent exploitation:	none - no fishery

COD - 3PS



HISTORY OF FRCC RECOMMENDATIONS:

In August 1993, the low estimates of biomass for this stock led the Council to recommend that fishing be discontinued, at least until April 30, 1994. The fishery was closed by DFO in September 1993. While the Council indicated in its November 1993 report that recommendations for this stock would be forthcoming following the analysis of the results of the spring survey, such a review was made unnecessary when the fishery was closed by the Minister of Fisheries and Oceans for the whole year.

In November 1994, the Council determined that the results of the 1994 survey confirmed earlier survey results and indicated that the stock abundance was at the lowest level observed since 1978. Consequently, the Council recommended that there be no directed fishing for 3Ps cod in 1995 and that by-catches be kept to the lowest possible level. The Council also recommended that efforts be made to expand surveys into inshore areas, that no recreational/food fishery be permitted and that a broad-based Sentinel Fishery program be implemented.

The Council's recommendations for 1996 were for a continued moratorium on commercial fishing and a significantly expanded Sentinel Fishery with an upset limit of 3,000t to evaluate the high catch rates found by Sentinel fishermen. In 1997 the FRCC recommended a limited commercial fishery with a TAC of 10,000t.

In March 1998, the Council recommended that the TAC for this stock be set at 20,000t, but that measures be taken to disperse the total catch over the fishing year to minimize impacts on stock sub-components. As in 1997, the 1998 recommendations included strict measures for the Conservation Harvesting Plans (CHP).

RECOMMENDATION S:

The FRCC recommends that:

1 The 1999 TAC be set at 30,000t;

2 Measures be taken to reasonably disperse the total catch over the period of the fishing year outside the major spawning season to minimize impacts on stock sub-components;

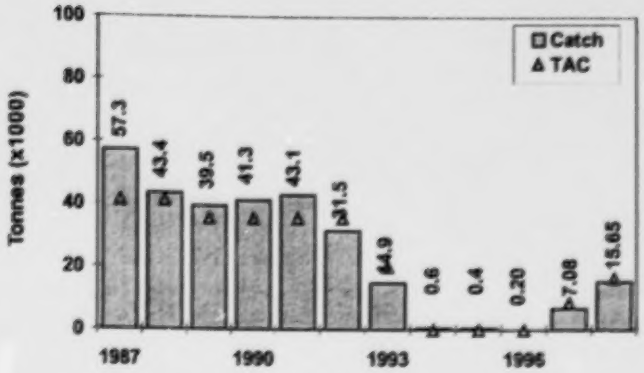
3 Fishing on spawning concentrations be minimized in April, May and June;

4 Conservation Harvesting Plans include:

- a) mandatory dockside monitoring and strict enforcement;
- b) effort be better controlled including limiting the amount of gear used by fishing enterprises so as to better match the available resource and quota;
- c) measures be implemented immediately to restrict the ability of fleet, through increases in mesh size, to target the 1989 and 1990 (i.e., age 10+) year classes as they move through the existing configuration of the fishery;

5 Acoustic survey techniques be integrated into the RV survey with the objectives of producing an absolute abundance estimate and reducing the high variability in the current survey; and

6 the winter fishery in the Burgeo Bank area should be closed from November 15 to April 15 to protect the 4RS3Pn stock components.



* 1998 Catch: as of Dec.2/98

1999 CONSULTATIONS:

Fishers noted that the commercial catch rates were high and many felt that the cod stock had fully recovered in 3Ps. Several fishers noted that catch rates are higher now than at any time in their history and that catch rates are high in all areas. Fishers expressed concern with the presence of seals reported in Fortune Bay , Placentia Bay, and Hermitage Bay. There were varying views from fishers whether the Sentinel fisheries index should be used in the assessment. There was mention of small fish in the catch being high-graded. DFO biomass estimates were viewed as being conservative. Fishers also indicated that the present monitoring of the fishery was much improved and that fishery information was much more accurate than in the past. The consensus among inshore fishers was that a TAC of 40,000t should be applied for 1999. Views were expressed to protect the large cod as these fish are the most productive spawners.

ANALYSIS:

The 1999 DFO Stock Status Report indicates that:

- Average fishing mortality (ages 7-14) increased to 0.13 during 1998 from 0.05 in 1997.
- Fish aged 4-6, and 8-9 dominated the catches and there were few fish older than age 13. Age compositions were broadly similar to those seen in the 1997 industry survey.
- Estimation of stock size is complicated by a seasonal movement of cod into 3Ps from adjacent management units, notably the northern Gulf of St. Lawrence (3Pn4RS) during winter.
- Current (1998) estimate of age at 50% maturity is close to the lowest in the time series at 5 yrs.
- Condition of cod in the 1998 survey appeared to be normal. Fishers reported that cod caught during the commercial fishery were in good condition, particularly during fall.
- The risk of the spawner biomass falling below 100,000t was estimated to be 9% with a catch of 20,000t in 1999.
- The probability of exceeding an average fishing mortality of 0.25 over ages 7-14 in 1999 at this catch level is estimated to be 5%.

The FRCC makes the following observations in relation to this stock:

The FRCC believes that this stock continues to improve.

Tagging indicates that 3Ps cod from Placentia Bay migrate to the coastal areas of 3L. The Council holds the view that the extent to which this occurs may have implications for future management of this stock. The Council is asking DFO to increase its research on stock mixing issues and intends to initiate a process to address this particular situation as soon as sufficient information becomes available. The RV survey continues to exhibit an unacceptable level of inter-annual variability. The acoustic survey of Placentia Bay and a portion of 3Ps provides the closest match to the SSR

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator:	improving
	Compared to average
Spawning biomass:	among the highest recorded
Total biomass:	at a high level
Recruitment:	good
Growth and Condition:	stable growth, lower than in the 1970s; good condition
Age structure:	1989, 1990, 1992 year classes strong
Distribution:	more widespread
Recent exploitation:	low

for the past few years of any available index. It is noted that natural mortality is at normal levels in contrast to other cod stocks.

The FRCC observes that as this stock complex approaches historical harvest levels it is important that we develop a clear understanding of parameters associated with "conserving" the stock, compared with those that may be employed in the context of "rebuilding" the stock. Accordingly, the Council intends to initiate a process over the next year, for the purpose of developing a framework to guide future decisions. Industry and fishermen generally believe that a TAC greater than 30,000t is justified and sustainable. In support of this, fishery catch rates have been strong relative to historical levels and alternative models have suggested somewhat higher biomass levels. Nevertheless, in light of the several uncertainties about the status of this stock, and in recognition of all factors and information, a somewhat more cautious approach is advised. There is general agreement that this stock has rebuilt substantially and is at or above historic levels and potential. In particular, the SSB is at high levels. Hence the goal for this stock is to sustain high productivity, allow for modest growth in distribution and age structure, while encouraging redevelopment of a commercial fishery.

To accomplish this goal, a TAC of 30,000t is recommended, together with several conservation measures to protect the stock and allow for an increase in age structure and distribution. The SSR includes population statistics derived from a model reliant on an index from a highly variable survey. This model indicates that the SSB is unlikely to decline with a TAC as high as 40,000t. However, there are uncertainties in this approach. In addition to these analyses being dependent on highly variable surveys, there is evidence of stock mixing and movements to adjacent zones, and current low age at maturity may increase and lead to lower the SSB. There is added uncertainty because Sentinel fishery catch rates have shown a decline in the past year. A primary consideration for the future of this stock is the current lack of fish of ages greater than 10 yrs. The current rebuilding of this stock has been dependent on the survival and spawning success of the abundant '89 and '90 year classes. The FRCC believes that allowing numbers of these fish to advance to an older age is key to sustaining high productivity.

SENTINEL FISHERY:

Gillnet catch ratios were low in 1998 relative to previous years. They show strong seasonality and are consistently highest during the fall in the eastern side of Placentia Bay.

Line trawl catch rates have declined since 1995 and exhibit strong seasonality. Sentinel catch rates were generally good during all four years of the survey and were substantially higher than commercial catch rates in concurrent years.

SCIENCE PRIORITIES LETTER

March 24 , 1999

The Honourable David Anderson, P.C., M.P.
Minister of Fisheries and Oceans
200 Kent Street
Ottawa, Ontario
K1A 0E6

Dear Minister:

One component of the mandate of the Fisheries Resource Conservation Council (FRCC) is to advise you on research and assessment priorities. Recommendations are presented on a regular basis. (Science Priorities letters of January 1994, December 1996, and March 1998). Scientific issues, that should be addressed as a priority and that are still relevant, are also raised in the FRCC's Report "A Groundfish Conservation Framework for Atlantic Canada" (FRCC.97.R3. July 1997). We were pleased to see your acceptance of elements of this report in your press release of December 31, 1998 and urge the complete implementation of those recommendations as soon as possible.

1. Erosion of Science Funding

The Council wishes to draw your attention to the continued erosion of funds allocated to DFO Science for fisheries research. These cuts cause two main problems - reductions in both survey work and in the continuation of longer-term initiatives.

The FRCC relies on Science to provide it with basic information on stock status in order to provide you with credible advice. Surveying is one of the most important functions of fisheries science. Surveys not only provide abundance indices for several groundfish stocks, but they also provide valuable information regarding the ecosystem as a whole. Scientists should seek to use surveys in an integrated manner, also considering alternative types of surveys where appropriate (acoustic, juvenile, eggs and larvae) in order to provide a wealth of information about the species' dynamics and about the marine environment. In this past year, a number of long-term surveys were canceled without consultation. With one exception, these cancellations appear to have been made on an *ad hoc* basis in response to budget restrictions. Without the information from these surveys, stakeholders are free to question the credibility of our recommendations as we are forced to make these recommendations with less independent information.

In our letter of March 1998, Council recommended several courses of action on longer-term issues. While work has begun on some of these initiatives, other issues have been deferred because of budgetary constraints. We recognize that these issues represent a long-term commitment and that final results cannot be expected in the short term. It is important, however, that these initiatives be pursued. Therefore, we are raising these issues again in 1999.

There is a wide spread perception by Council members and many stakeholders that the DFO/Coast Guard merger has resulted in a significant erosion of at-sea data gathering. We continue to hear reports of vessels tied up at the wharf because of a lack of funds to carry out previously funded research surveys. This, coupled with reductions in the Science budget over the past few years, is of concern to the Council. Without an adequate capability of gathering much needed scientific data at-sea, the basis for stock assessments will increasingly be questioned by fishers. As well, the Council's job will be made that much more difficult as we attempt to formulate reasonable recommendations to you, particularly on TACs. After so many years of moratoria in some stocks, and vastly reduced fishing in others, stakeholders are expecting that DFO Science should understand more about these stocks and about the overall ecosystem.

I think it is fair to say that Canadians are expecting that the basic survey work will continue and that courses of action on those longer-term issues outlined in our March 1998 letter will continue. Many might find it unacceptable to discover that DFO no longer has the capability to continue much of the research that was carried out in the past. **The FRCC, therefore, strongly advocates the restoration of the fisheries science program budget.**

2 Science Industry Initiatives

The science sector must continue to work to bridge the gaps which exist between science and industry. While several initiatives are already in place (e.g. sentinel surveys, offshore surveys on the Grand Banks and in 3Ps, redfish surveys, ITQ surveys in southern Nova Scotia), the FRCC previously noted that they are difficult to implement and that they are not consistently coordinated among the regions. Cooperation between the science sector and the industry should be systematically considered within the co-management approach (Integrated Fisheries Management Plans and Joint Project Agreements).

Sentinel fisheries are now beginning to provide a significant time series. As an example, data from both inshore fixed gear and mobile gear sentinel fisheries in 3Pn4RS and 4TVn are now formally incorporated in the analytical assessment of those cod stocks.

Sentinel fisheries, as well as other science-industry initiatives are important steps for reconciling scientists and the industry's perception of the status of the resource.

The Council supports the continuation and expansion of programs where the fishermen play an integral part in obtaining much needed scientific information and samples. However, fishermen must not just be considered merely as gatherers of data and providers of free platforms, but must be integrated into the scientific process as much as possible.

In its previous letter, the FRCC recommended that an Atlantic Coordinator should be appointed in order to promote science-industry initiatives both inside and outside the Department and to harmonize initiatives such as sentinel fisheries across the Atlantic and other cooperative ventures. **The Council considers this a high priority.**

3. The Recruitment Dilemma

In our March 1998 letter, the Council recommended that existing information about the recruitment issue should be consolidated in a formal report in a language understandable to a wide audience. That report was not provided.

The Council recognizes that collaborative work has already been done within DFO and with outside partners. Most of the published works are written in scientific formats and published in journals that are not easily accessible to a wide audience. We do not, however, have a consolidated description of the state of knowledge with respect to recruitment. It is important that all interested parties understand what is happening and what are the knowledge gaps.

While the industry has endured painful fishing closures in some stocks, signs of recovery are limited. For other stocks, for which fisheries are not under moratorium, warning signals are apparent. We must understand why some populations, such as the Southern Gulf of Saint Lawrence cod, are not able to replenish themselves even though the spawning stock biomass is significant.

The FRCC recommends again, as a priority, that a formal report on the recruitment dilemma should be provided before December 1999. We reiterate our recommendation that a DFO science committee be tasked to coordinate the preparation of this report.

4. Groundfish Consumption by Seals

This remains a major issue and DFO Science must expedite efforts to quantify the effect of seals' predation on groundfish. Valuable information, especially related to fish mortality by seals, is now being estimated for some stocks. The Council recommends that this procedure of treating seals population as a "fishing fleet" be adopted for all groundfish assessments where seal predation is a significant factor in resource status.

The Council will be making more specific recommendations on this issue in its next report, expected to be released in early May.

5. Identification and Verification of Stock Management Units

Mixing of stock units is a critical issue. For example, in the 2J3KL area, the issue of the overflow of the inshore cod stock biomass to recolonize the offshore area of the Grand Banks should be addressed as a very high priority.

The FRCC acknowledges that current scientific tools (e.g. otolith fingerprints, DNA probes, satellite telemetry) are now being used to identify stock boundaries. *Stock unit identification* is being addressed through joint projects between DFO and Universities, dealing with genetic diversity of populations. This research should be pursued and expanded. These studies should also be complemented by other sources of data such as tagging studies.

A large cod tagging program is already implemented in the Northern Gulf of Saint Lawrence. That type of program should be expanded to include other cod stocks. **The FRCC strongly recommends, once again, that a major tagging program, using the most appropriate mix of technologies, be implemented on cod stocks to help define mixing among stock management units. This program should be a collaborative effort involving industry participation.**

The FRCC recommends that because of the important implications of this work to industry and other interested parties, results be communicated in an integrated document.

6. The Scientific Process

The FRCC is very concerned about the presentation of scientific advice it receives from DFO fisheries science. In the recent period, there appears to be a breakdown in the scientific peer review process in that the formation of a consensus position is increasingly difficult to achieve both in the zonal and regional processes. The result of this breakdown in the process is that two or more options for total allowable catches are provided. This puts industry, the Council, and you, Mr. Minister, in a position where credible decision making is compromised and difficult to defend.

The FRCC urges you to encourage the achievement of consensus in the peer review process that is critical in the delivery of good science. The FRCC needs good science in order to meet its mandate.

In conclusion, the Council believes that the continuing financial constraints placed on fisheries science are manifesting themselves in an environment that is not conducive to the collegial collaboration required for good science. Sufficient funds must be made available to permit the process to work effectively.

On behalf of the Council, I would like to take this opportunity to thank the Department for the excellent support we have received over the last year and fully support the work of DFO scientists. Continuing to work together will assist us in making rational recommendations to you regarding the conservation and rebuilding of groundfish stocks.

Yours sincerely,

Fred Woodman
Chairman

CHAPTER 6:
GEORGES BANK GROUNDFISH STOCKS

LETTER TO THE MINISTER

May 19, 1999

The Honourable David Anderson, P.C., M. P.
Minister of Fisheries and Oceans
200 Kent St.
Ottawa, Ontario
K1A 0E6

Dear Minister:

The mandate of the Fisheries Resource Conservation Council (FRCC) requires that it advise you on conservation requirements for Atlantic fish stocks. In keeping with this mandate we have conducted consultations with science and industry representatives on the conservation requirements for Georges Bank groundfish stocks.

The FRCC has now concluded consultations for Georges Bank haddock, cod and yellowtail flounder. Our consultations, held in Yarmouth, Nova Scotia on May 11, were characterized by a strong conservation ethic on the part of all stakeholders. Those who fish on Georges Bank have seen the signs of recovery in the yellowtail flounder and haddock stocks. Similar recovery is not apparent in the cod stock. Stakeholders are committed to seeing these stocks rebuild. All who attended our consultations believed that a rebuilding strategy for these stocks should be aggressively pursued and that quotas should continue to be set below the $F_{0.1}$ level to allow rebuilding to occur.

As we did in the past year, the Council wants to take this opportunity to thank the Department for the fine presentation given by scientists from the St. Andrews Biological Station. The high level of debate and discussion at the Yarmouth consultation indicated how healthy the continued rapport between science and industry is in this area. We believe this is also indicative of the quality of the advice and the presentation, and ultimately, how far we have come in working together to achieve our conservation goals, particularly in respect of the haddock and yellowtail flounder stocks.

In the past, the Council had not recommended total removals for these three transboundary stocks, preferring instead to recommend levels for Canadian quotas only. This was because the US management system was based primarily on effort controls and not TACs or quotas. In determining Canadian quota recommendations previously, the Council took into consideration the estimated catch by US vessels and apportioned the remainder of what was believed to be a sensible total removals level as the recommended Canadian quota.

The US has recently been increasing its catches in these stocks and has now changed its management system and is determining a "total target TAC" as well as what portion should be the "US target TAC". The Council feels that, in light of these increased catches, it is important to have a complete and transparent view of catches and total resource status. The Council, therefore, believes that in order to assure conservation of these stocks, we should present advice on the total stock basis as it does for all other groundfish stocks. Unfortunately, Canada and the US have yet to determine what share of the total removals level should be apportioned to each country. This is of significant concern to the Council because there is considerable risk of overexploitation of these resources.

If the two countries cannot, in the near future, agree on sharing arrangements for these stocks then the sacrifices the Canadian industry has made over the past few years in rebuilding will be lost and the stocks will be subject to overfishing. The Council has recommended that these discussions take place many times already with no apparent result. **Therefore, the Council again strongly recommends that these discussions be undertaken with the US as soon as possible to ensure that consistent management and conservation measures are put in on both sides of the boundary line.**

The Council has also identified rebuilding thresholds for these stocks, as we believe there is a relationship between the size of the spawning stock biomass and good recruitment. For cod we have set this threshold for the spawning stock biomass at 25,000t and for haddock at 40,000t. We are optimistic that with an aggressive rebuilding strategy, a strong conservation ethic on the part of the fishing industry in this area, and some help from Mother Nature, we can achieve these thresholds in the near future. For yellowtail flounder it is unclear what the level should be as these levels are dependent on the models being used. Scientists have recently changed the model for this stock and hopefully we will be in a better position to determine a threshold level in the near future.

The fecundity of cod and haddock improves with age, i.e. the older the fish, the better the chances of recruitment, and therefore efforts must be made to improve the age structure of these stocks, as well as the yellowtail flounder.

It should be noted that for the Georges Bank cod stock, we are seeing signs of danger particularly with respect to the lack of good incoming recruitment. Although the total mature biomass has grown by more than 20% from 1998 to 1999, most of the growth came from the existing mature biomass, and not from recruitment. Continued poor recruitment could eventually result in a depletion of the spawning stock biomass to dangerously low levels and certainly to the level of commercial extinction. This stock is fished in a mixed fishery with haddock, pollock and, to a lesser extent, yellowtail. In the 1998 fishery, haddock quota was left uncaught due to low cod quota levels. With an improved resource outlook for haddock and yellowtail flounder, this situation will only become more acute. While the recommendation for the 1999 cod total removals is below F0.1 and there is growth in the resource, we are concerned that this is a misleading portrayal of healthy resource status. We wish to alert you and the industry of our concern. We believe that the 1999 fishery must be managed with the utmost care to ensure that good conservation practices are in place. The Council intends to carefully review this situation again next year with a view to thoroughly evaluating stock status and determining what the long term conservation strategy for 5Zjm cod should be. Key in our assessment will be how much progress has been made with the US on cooperative management and conservation measures.

We note that the 1998 year-class is the lowest ever observed. For these reasons, the Council has decided to be even more conservative than it has in previous year's quota recommendations. Given the low recommended total removals for cod, the Council is concerned about the potential problems that may arise including the increased potential for dumping and discarding. We have recommended that DFO identify control vessels, with observers onboard, to compare against landings of vessels without observers as real time mechanisms to control cod bycatch encountered during the fishery in this area. Observer coverage on these vessels should be increased, so when combined with 100% Dockside Monitoring, decisions can be quickly made to close fisheries by area or by fleet as necessary.

For yellowtail flounder, the Council recognized that the improvement in the health of this stock can certainly be credited partly to the measures implemented by industry over the past few years and encourages continuation of these initiatives. While this stock is clearly showing signs of significant improvement, caution must still be exercised. The majority of the stock appears to be found quite close to the boundary line with the US and, as such, could be overfished if the necessary monitoring and surveillance is not in place. There was also concern that US scallop draggers report catching quantities of yellowtail, but similar reports do not appear from the Canadian fleet. This is something that needs to be investigated as any unreported dumping needs to be quantified.

As with the yellowtail flounder stock, the Council believes that improvements in the haddock stock can certainly be credited partly to the measures implemented by industry over the past few years and encourages continuation of these initiatives. The Council remains optimistic that with the improved status of the 1996 year class and the predicted 1998 year class, achieving the 40,000t spawning stock biomass threshold is possible in the near future.

Since 1996, the FRCC has adopted a rebuilding strategy for these stocks. Two of the criteria used in the past are still valid today:

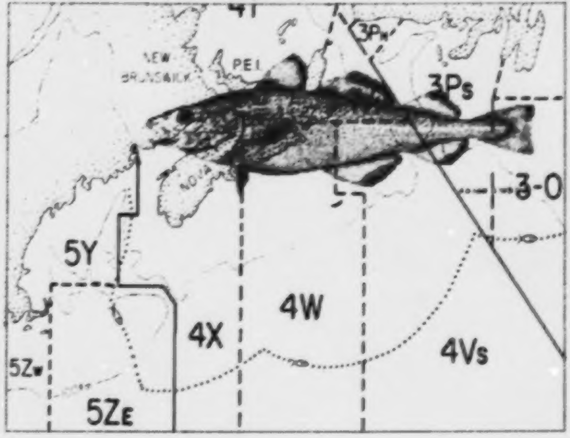
- setting quotas below $F_{0.1}$,
- target an increase in biomass by 5 percent or more,

Your Council is pleased to have this opportunity to present you with this advice and we trust you will find this helpful in your deliberations.

Sincerely,

Fred Woodman
Chairman

COD - 5ZJ,M



HISTORY OF FRCC RECOMMENDATIONS:

In November 1993, the Council concluded that, from a conservation perspective, the fishery for this stock should be closed. The Council noted, however, that a closure by Canada alone would not be sufficient to protect the stock without corresponding action by the United States. The Council urged that consultations continue with the United States with the objective of undertaking urgent and immediate management action to rebuild this stock.

In 1994, the fishery was closed to all sectors from January 1 to May 31 and for an additional month to June 30 for the offshore sector.The U.S. fishery was closed from January 1 to June 30. In November 1994, the Council recommended that bilateral consultations continue with the objective of undertaking management action appropriate to re-build this stock.

In May 1995, the FRCC recommended that there be no directed fishing for 5Zj,m cod in 1995 and that by-catch be limited to less than 1,000t. In November 1995, the Council again recommended that bilateral consultations continue and that the fishery remain closed until June 1996.

In May 1996 and May 1997 the Council adopted a strong rebuilding strategy for these stocks and set the following criteria: quotas below F_{01} target an annual increase in biomass of 5 percent or more, accept a risk

RECOMMENDATIONS:

The FRCC recommends that:

1 the total removals for the entire stock area (5Zjm) should be set at 2,400t (combined Canadian / US total removals);

2 DFO should continue to identify control vessels to compare against landings from vessels without observers as real time mechanisms to control cod bycatch encountered during the fishery in this area. Observer coverage on these vessels should be increased, so when combined with 100% DMP, decisions can be made quickly to close fisheries by area or by fleet as necessary;

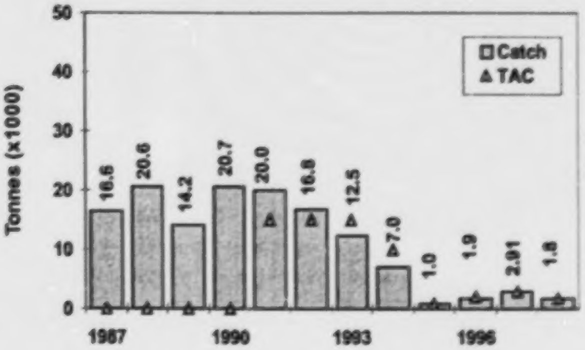
3 at-sea enforcement be increased, particularly at times when dumping and discarding could be a problem;

4 appropriate discussions continue with the US with the objective of ensuring continued stock rebuilding by adopting consistent management and conservation measures on both sides of the Hague line and to ensure that the total removals are not in excess of the recommended total removals level;

5 the fishery commence June 1, 1999 to allow a better mix of cod and haddock to minimize bycatch problems in the fishery;

6 in anticipation of a widening gap in the haddock and cod total removals, and in light of their existing catch relationships, industry and DFO should investigate and undertake any possible measures to improve the ability of industry to avoid or minimize the catch of cod during a directed haddock fishery; and

7 particularly in light of the critical condition of this stock, the nature of any activity operating in the spawning area be investigated, with the objective of implementing appropriate measures to minimize all fishing and other activity in these areas during the peak spawning period.



of decline in biomass (from the risk analysis) in the order of 20 percent or less; and establishing an appropriate ratio of cod to haddock to minimize dumping and discarding. The FRCC recommended Canadian quotas for 5Zjm cod be set at 2,000t in 1996 and at 3,000t in 1997.

In 1998, the FRCC recommended that the Canadian quota for 5Zjm cod be decreased to 1,900t, and that the fishery commence June 1, 1998 to allow a better mix of cod and haddock to minimize by-catch problems in the fishery. The Council further recommended that DFO identify control vessels to compare against landings from vessels without observers as real time mechanisms to control cod by-catch encountered during the fishery in this area. The FRCC reiterated its recommendation that bilateral discussions with the U.S. continue with the objective of undertaking management action appropriate to re-build this stock..

1999 CONSULTATIONS:

Consultations on 5Zjm cod were held in Yarmouth on May 11,1999. Stakeholders from both the mobile and fixed gear sectors acknowledged that the 1998 FRCC recommendations on Georges Bank stocks achieved desirable results and that rebuilding should continue. Generally fixed gear fishers expressed the gravity of the cod situation is not apparent in their fishery. The stakeholders comments mainly focussed on the lack of cod recruitment and explored reasons on why haddock and yellowtail recruitment are experiencing 20 year highs. They concluded that recent exploitation rates are below $F_{0.1}$ on all three stocks yet cod was the only stock not reacting positively with incoming recruits. Industry recommendations were for the status quo, or slightly higher levels, regarding quota levels. In a brief received later, slightly lower levels were recommended on this stock. Industry reported that an improved management approach designed in Conservation Harvest Plans in conjunction with DFO will achieve to control at-sea activity of the fleets.

ANALYSIS:

The 1999 DFO Stock Status Report indicates that:

- Combined Canada and US catches in 1998 were 2,700t.
- Growth and higher survival of the 1992 and the 1995 year-classes were the primary source which increased adult biomass from 8,000t in 1995 to about 19,000t in 1999.
- Recruitment has been below average since the 1990 year-class, and the 1997-98 year-classes are the lowest observed. Recruitment has been observed to be low when adult biomass is less than 25,000t.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator:	some signs of recovery; but poor recruitment is cause for concern
	Compared to average
Spawning Biomass:	increasing but below the 25,000t threshold
Total Biomass:	below long term average
Recruitment:	recovery since 1994 due to moderate year classes in 1992 and 1995; 1997 and 1998 year classes lowest observed
Growth and Condition:	weights-at-age remain low overall
Age Structure:	landings dominated by 1995 year class
Distribution:	consistent over time
Recent Exploitation Level:	near $F_{0.1}$ since 1995

- The likelihood of a 20% increase in biomass, as observed in 1998, is low due to this recent poor recruitment. It is unlikely that an adult biomass of 25,000t can be achieved in the near future.
- Exploitation rate on ages 4+ declined from 65% in 1993 to near the $F_{0.1}$ level in 1995 and remained near $F_{0.1}$ in 1996-98.
- At the projected 1999 $F_{0.1}$ yield of 3,700t there is over a 50% probability that the biomass will decrease in 2000. To achieve a 50% probability of modest (10%) biomass increase would require a 1999 quota of about half the 1998 catch.

This is a transboundary stock and consistent measures need to be taken by both Canada and the US in order to manage the stock on a rational basis. Furthermore, recent changes in the US management system, whereby they now set a "US Target TAC" necessitates that the Council change its previous method of recommending only a Canadian quota, and adopt recommendations for an overall TAC. The Council notes that catches by US vessels continue to increase each year.

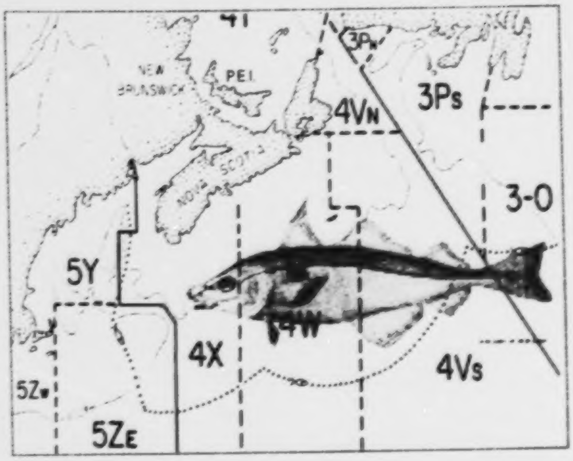
During consultations, the Council was made aware that the scallop fishery may include activity in known cod spawning areas during the peak spawning period. The Council had endorsed the principle of protecting spawning concentrations and consistently recommends that fishing in known spawning areas be minimized during the peak spawning period.

The Council recognizes that, in this area, management of the mixed fishery for cod and haddock poses special challenges for managers and industry.As haddock on Georges Bank recovers and the gaps in biomass between these two species has widened, the industry has had to adjust. Current projections for these two stocks may require that further such efforts be made in coming seasons.

The Council continues to be very concerned with the lack of recruitment experienced in this stock. However the decline in weight-at-age is reversed in 1998. This stock is at approximately 19,000t of spawning stock biomass in 1999 compared to a low of 8,000t in 1995. This stock experienced an increase in biomass of 23% from 1998 to 1999, due solely to growth. However, the subsequent recruitment is very weak, which will reverse this trend. The interim goal for this fishery is to get the spawning stock biomass (ages 3+) above the 25,000t threshold.

A total removal level of 2,400t for the entire stock area (5Zjm) should allow for growth in this stock but only for the short term.

HADDOCK - 5ZJ,M



HISTORY OF FRCC RECOMMENDATIONS:

In August 1993 and in November 1993, the Council recommended that, from a conservation perspective, the haddock fishery on Georges Bank should be closed. The Council urged the continuation of the consultations with the United States with the objective of undertaking urgent and immediate management action to rebuild this stock. The fishery was closed to all sectors from January 1 to May 31 in 1994 and for an additional month, to June 30, for the offshore. The management measures concentrated on avoiding the capture of the 1992 year-class estimated to be 45 cm throughout most of the year.

In 1994, the Council recommended that bilateral consultations continue with the objective of undertaking management action appropriate to rebuild this stock. In the meantime, the Council recommended that the fishery be closed until June 1995, prior to which time the Council would provide a definite recommendation with respect to the 1995 TAC. In May 1995, the Council recommended that the 1995 TAC for 5Zjm haddock be set at 2,500t.

In May 1996, the Council adopted a rebuilding strategy for this stock based on the following criteria: setting quotas below $F_{0.1}$ target an increase in biomass by 5 percent or more, risk of decline in biomass (from the risk analysis) in the order of 20 percent or less; and establishing an appropriate ratio of cod to haddock to minimize dumping and discarding. In 1996 the FRCC recommended that the Canadian quota for 5Zjm haddock be set at 4,500t and in 1997 the FRCC recommended the Canadian quota be reduced to 3,200t.

In 1998, the FRCC recommended that the Canadian quota for this stock be increased to 3,900t, and that the fishery commence June 1, 1998 to allow a better mix of cod and haddock to minimize by-catch problems in the fishery. The Council also reiterated its recommendation that bilateral discussions with the U.S. continue.

RECOMMENDATIONS:

The FRCC recommends that:

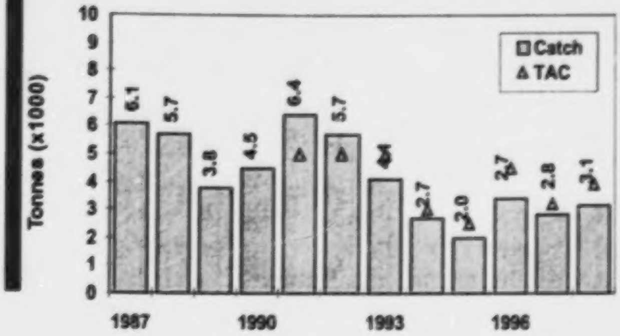
1 the total removals for the entire stock area (5Zjm) should be set at 4000t (Combined Canadian/US total removals);

2 the fishery commence June 1, 1998 to allow a better mix of cod and haddock to minimize bycatch problems in the fishery, and surveillance and monitoring be stepped up for at least the first few weeks of the fishery;

3 appropriate discussions continue with the USA with the objective of ensuring continued stock rebuilding by adopting consistent management and conservation measures on both sides of the Hague line and to ensure that the total removals are not in excess of the overall TAC;

4 DFO should continue to identify control vessels to compare against landings from vessels without observers as real time mechanisms to control cod bycatch encountered during the fishery in this area. Observer coverage on these vessels should be increased, so when combined with 100% DMP, decisions can be made quickly to close fisheries by area or by fleet as necessary; and

5 efforts be made to protect the 1998 year class, e.g., hook size, mesh size, etc.



1999 CONSULTATIONS:

Consultations on 5Z haddock were held in Yarmouth on May 11, 1999. Stakeholders expressed satisfaction with the initial rebuilding that took place over the past year but were unanimous in recommending that caution still prevail. Industry recommendations for TACs were all below $F_{0.1}$. There was also general agreement that we should aim for a 40,000t threshold in the spawning stock biomass (ages 3+) to improve the chances of good recruitment. W ith the apparently strong 40 million 1998 year class (strongest since 1978) stakeholders were of the opinion that the 40,000t threshold in spawning stock biomass (ages 3+) may be reached by 2001-2002. Industry participants were all of the opinion that this fishery should open on June 1 as this was a time when haddock could be fished without a lot of mixing with cod.

ANALYSIS:

The 1999 DFO Stock Status Report indicates that:

- Combined Canada and US catches in 1998 were about 3,700t.
- Exploitation below $F_{0.1}$ since 1995.
- The 1992 and 1996 year-classes were moderate while the 1997 year-class was weaker. Preliminary indications suggest that the 1998 year-class will be strong.
- Biomass has increased since 1993 to near recent average but remains only about 1/3 of historical average.
- Growth of biomass for ages 3-8 is not expected to be strong during 1999 and the biomass will remain below the 40,000t threshold.

This is a transboundary stock and consistent measures need to be taken by both Canada and the US in order to manage the stock on a rational basis. Furthermore, recent changes in the US management system, whereby they now set a "US Target TAC" necessitates that the Council change its previous method of recommending only a Canadian quota, and adopt recommendations for an overall TAC.

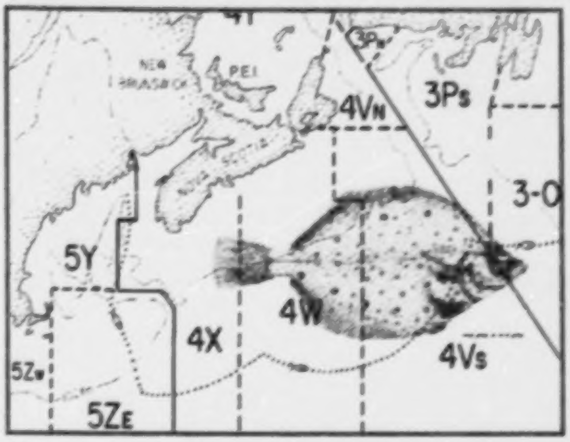
The Council recognizes the improvements made in this stock as a result of the conservation measures adopted by industry in recent years and encourages a continuation of these initiatives. The Council is optimistic that with the improved status of the 1996 year class and predicted large 1998 year class, achieving the 40,000t spawning stock biomass threshold is possible in the very near future. Above this level, the FRCC and the industry in this area believes that there is an improved chance of good recruitment to the fishery. The increase in biomass in ages 3-8 biomass in 1999 was about 24%.

A TAC for the entire stock area (5Zjm) of 4,000t is about 63% of the $F_{0.1}$ level of 6300t. It is suspected that this level of catch will keep exploitation low and will increase the spawning biomass by about 10%.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator	some signs of recovery
	Compared to average
Spawning Biomass:	increasing but below 40,000t threshold
Total Biomass:	doubled since 1993 but 1/3 of levels of 1930s to 1950s
Recruitment:	sporadic; 1992, 1993 and 1996 year classes moderate; preliminary information on the 1998 year class suggests it is strong
Growth and Condition:	average
Age Structure:	expanding
Distribution:	more than 90% of biomass on Canadian side, limited on US side
Recent Exploitation Level:	below $F_{0.1}$

YELLOWTAIL FLOUNDER - 5ZJMHN



HISTORY OF FRCC RECOMMENDATIONS:

The directed fishery for yellowtail flounder began only recently, with 8 to 10 boats participating in a fishery. It expanded rapidly in 1994, with about 40 vessels pursuing the fishery. In November 1995, the Council recommended that bilateral consultations continue with the US with the objective of undertaking management action appropriate to rebuild this stock. In the meantime, it was recommended that the fishery remain closed until June 1996, prior to which time the Council would provide a definitive recommendation with respect to the 1996 TAC.

In May 1996, the Council adopted a rebuilding strategy for this stock which was based on the following: setting quotas below $F_{0.1}$ target an increase in biomass by 5 percent or more, and risk of decline in biomass (from the risk analysis) in the order of 20 percent or less. In 1996 the FRCC recommended that the Canadian quota for 5Zjmhn yellowtail flounder be set at 415t and in 1997 the FRCC recommended that the Canadian quota be increased to 800t.

In 1998, the FRCC recommended that the Canadian quota for this stock be set at 1,200t; and that bilateral discussions with the US continue. The FRCC also recommended that DFO implement an age reading capability for yellowtail flounder on Georges Bank.

1999 CONSULTATIONS:

Consultations on 5Zjmhn yellowtail flounder were held in Yarmouth on May 11, 1999. Stakeholders expressed satisfaction at the rebuilding which has taken place, but asked the FRCC to remain cautious in its recommendations. Participants noted that the US catches of yellowtail flounder in 1998 had increased substantially from the previous year. The industry felt this stock was quite sedentary in nature and acknowledged its distribution was largely adjacent to the Hague line. Industry was pleased to see that the 1997 year class was the largest since 1980 and felt this stock was rebuilding nicely. There was a recommendation from participants that checks be made by DFO on the bycatch of yellowtail flounder by the Georges Bank Canadian scallop fleet due to the fact that US scallop fishers reported bycatches.

RECOMMENDATIONS:

The FRCC recommends that:

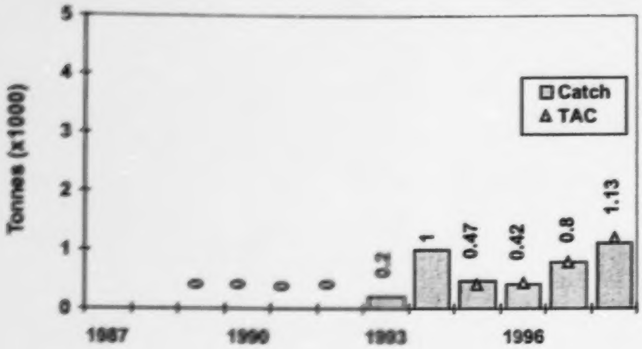
1 the total removals for the entire stock area (5Zjmhn) should be set at 4,000t (Combined Canadian/US total removals);

2 the Department of Fisheries and Oceans continue to implement an age reading capability for yellowtail flounder on Georges Bank;

3 efforts be made to develop appropriate measures to protect the incoming 1997 year class, e.g., mesh size, increase or configuration, etc.;

4 any discarding of yellowtail flounder in the scallop fishery be monitored toward total annual estimates of the extent of this by-catch; and

5 appropriate discussions continue with the US with the objective of ensuring continued stock rebuilding by adopting consistent management and conservation measures on both sides of the Hague line and to ensure that the total removals are not in excess of the overall TAC.



ANALYSIS:

The 1999 DFO Stock Status Report for this species indicates that:

- Combined Canada/US catches have been increasing since 1995, and in 1998 were 3,111t.
- Population biomass has increased since 1995, and is now about ½ of the biomass associated with maximum sustainable yield.
- Recent recruitment has improved relative to the 1980s, and the 1997 year-class appears to be strongest since 1980.
- Exploitation rates have been less than the $F_{0.1}$ target of 20% during the past three years.
- There is a high probability that population biomass levels will continue to increase with fishery removals in 2000 equal to those of 1998, but the amount of the increase is uncertain.

This is a transboundary stock, which is concentrated very close to the international boundary. Consistent measures need to be taken by both Canada and the US in order to manage the stock on a rational basis. Furthermore, recent changes in the US management system, whereby they now set a "US Target TAC " necessitates that the Council change its previous method of recommending only a Canadian quota, and adopt recommendations for an overall TAC.

The Council recognizes the improvement made in this stock as a result of a cautious approach taken by industry in this fishery in recent years and encourages a continuation of these initiatives. Industry also raised the issue of proper aging of this stock and noted that it would reduce the uncertainties in the calculations of the size of the population. Action should be taken to address this uncertainty in the Canadian fishery so that more precise population estimates can be made.

The biomass of yellowtail flounder is below the long term average but has steadily shown signs of improvement. Moderate-to-strong year classes in the 1990s and a strong 1997 year class is very positive for this stock. The age structure of the population is expanding, as evidenced by the size composition in the landings over the past 4 years. Exploitation levels were well below $F_{0.1}$ in 1995, 1996, 1997 and 1998.

A TAC for the entire stock area (5Zjmn) of 4,000t is recommended. The Council believes that this level will permit stock rebuilding; will keep exploitation within 91% of the VPA model ($F_{0.1}$) of 4,383t. As well, this TAC level may result in a significant increase in the SSB that may be as high as 50%.

The Council notes that the above figures are calculated based on the method which provides the most conservative levels for $F_{0.1}$. The scientists applied another method in the DFO SSR that provided for a higher estimate of $F_{0.1}$ (or its equivalent). The Council is cautious, and believes that the alternate method may be overly optimistic.

COUNCIL'S VIEWS ON STOCK STATUS:

Overall Stock Indicator:	rebuilding
	Compared to average
Spawning Biomass:	rebuilding
Total Biomass:	rebuilding
Recruitment:	moderate/strong year classes in 1990's; the 1997 year class estimated to be strong
Growth and Condition:	slight decline in weights-at-age in 1998 for older ages
Age Structure:	expanding
Distribution:	consistent over time
Recent Exploitation Level:	below $F_{0.1}$

CHAPTER 7:
COD STOCKS IN DIVISIONS 2J3KL

LETTER TO THE MINISTER

May 27, 1999

The Honourable David Anderson, P.C., M.P.
Minister of Fisheries and Oceans
200 Kent Street
Ottawa, Ontario
K1A 0E6

Dear Minister:

At your request the Council delayed providing recommendations on the northern cod stock (2J3KL) to allow for a scientific peer review of an independent scientific analysis presented to the Council during consultations in March 1999. This peer review process has been completed and the Council was provided a copy of the group's report for use in our recent deliberations on 2J3KL cod.

Our deliberations on this stock were difficult this time, not because of the additional independent scientific analysis presented us, but because the data are inadequate as a basis for a scientific assessment and setting of a TAC for this stock. As noted in our report, there is little information on the coastal components, which currently comprise the majority of the stock biomass. It is, therefore, imperative that appropriate surveys be implemented immediately to assess the absolute abundance of cod in coastal regions.

It is also our view that total removals from this stock may be underestimated as a consequence of unreported landings and those removals must, therefore, be more closely monitored. While the independent study indicated substantially higher biomass levels in the coastal components, the peer review panel found that this analysis does not form a basis for assessment of the coastal portion of this stock.

There are significant uncertainties regarding the status of this stock. The geographic distribution of where we know there to be fish is far less than 50% of the geographic range for this stock. Based on catch rates, there are significant quantities in those small areas where we do know there are fish. With the uncertainties, the Council is moving in a precautionary manner from risk avoidance to risk management. However, in order to do justice to both the fishing communities and to the fish, a much-improved database to work from is a must for future years.

It should be pointed out, however, that not everything is bleak as the sentinel fishery catch rates are showing positive results and are much higher than commercial catch rates for the same gears pre-moratorium. Also, recruitment seems to be improving in the inshore areas.

The setting of a TAC for this stock cannot be done in a defensible scientific manner, as is the typical procedure the Council follows for other stocks. We have therefore provided a range for the TAC of between 6,000t and 9,000t. As well, we have made a number of other very specific recommendations, which are just as important as the TAC level. Many of these concern improving the scientific basis for future assessments.

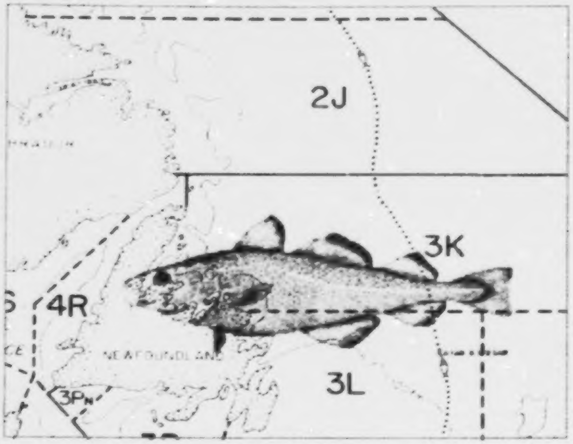
The method we have chosen for setting the TAC for 1999 is regarded by the Council as a default method put forth only because of the unacceptable lack of quantitative data on the coastal biomass. The Council believes that it will be impossible to provide more specific TAC recommendations on this stock in future unless quantitative data are provided on coastal abundance.

Your Council is pleased to have this opportunity to present you with this advice and we trust you will find this helpful in your deliberations.

Sincerely,

Fred Woodman
Chairman

COD - 2J3KL



HISTORY OF FRCC RECOMMENDATIONS:

In 1993, the Council indicated that this stock was at a very low level with poor recruitment prospects, and that a recovery of the spawning biomass was unlikely before the year 2000 at the earliest. The Council recommended that the moratorium on fishing 2J3KL cod be continued for 1994 and that strict limits be placed on food fisheries. In 1995, the Council emphasized the importance of the Sentinel Fishery in monitoring this stock during the moratorium. As in 1996 and 1997, the Council recommended in 1998 that the moratorium on this stock be continued. As part of the recommendations for 1998, the FRCC reiterated its 1997 recommendation that the sentinel fishery be expanded to include the offshore, and that additional financial resources be made available to carry out this program. Also, an index program be established with a maximum catch of 4,000t.

1999 CONSULTATIONS:

Fishers reported that the sentinel fishery is reflective of their experience and knowledge. The program began in 1995 and now is a four year time series. Sentinel gillnet catch rates were increasing significantly over this period and were following this pattern from the coastal area including from White Bay through St. Mary's Bay. It was noted that there was an apparent low abundance in areas north of White Bay. Catch rates were very good to excellent compared to the reference level in the late 1980s. Gillnet catches per net were reported to be on average about 45 pounds during the late 1980s and are now ranging consistently over the

RECOMMENDATIONS :

The FRCC recommends that:

1.1 the TAC for 1999 be set between 6000 and 9000t to allow for a limited commercial fishery including a Sentinel fishery component for the coastal portions of 3L and 3K only, spread out over White Bay, Notre Dame, Bonavista, Trinity Bay, Conception Bay and the Southern Shore;

1.2 fishing be minimized during peak spawning periods and on spawning and pre-spawning concentrations, in both coastal and shelf locations (e.g., Hawke Channel, Virgin Rocks, Tobin's Point), and be at a low level in all seasons;

1.3 Smith Sound, Trinity Bay be closed to all commercial groundfishing and all gillnets;

1.4 a research plan be implemented immediately to conduct an acoustic survey of over-wintering and prespawning cod aggregations in coastal waters from southern 3L to 3K in 2000;

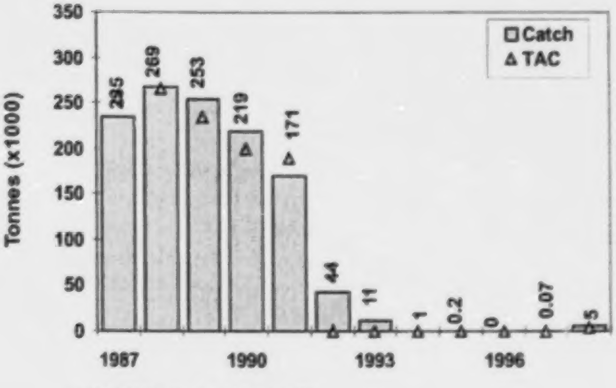
1.5 juvenile surveys of cod on the shelf and in coastal areas be continued with the goal of developing a recruitment index;

1.6 the sentinel program in 2J3KL begin as soon as possible, and not wait for future decisions on overall quota or TAC levels, and that it contain a tagging component in 3K and 3L;

1.7 additional financial resources be made available to carry out this program;

1.8 the shrimp fishery in 3K be closely monitored for by-catch, especially in the Hawke Channel; and

1.9 measures be implemented immediately to restrict the ability of fleet, through increases in mesh size, to target the 1989 and 1990 (i.e., age 10+) year classes as they move through the existing configuration of the fishery.



* 1998 Catch: as of Dec.2/98

months from July through September at rates from approximately 100 pounds up to a high of about 900 pounds. These catch rates are reflective of the Sentinel Fishery from White Bay south to St. Mary's Bay. Catch rates of small fish were reported to be good, particularly in the most northern areas as evidenced by-catch rates in small mesh gillnets used in the Sentinel Fishery program. Fishers recommended an extensive tagging program to cover the entire inshore area of 2J3KL and that the tagging occur prior to the end of May 1999. Fishers were concerned that the science process does not incorporate their experience and the trends they observe.

Some fishers expressed concern over the lack of fish in the area north of White Bay. It was noted that many fishermen relied heavily on the harvest of cod from the 2J and northern 3K areas, or the northern part of the stock range, during many years of the northern cod fishery. There was a consensus view that cod in the offshore areas of 2J3KL are at an extremely low level. Many inshore fishers in areas 3KL are of the view that a commercial fishery is sustainable and should be established in 1999 at a level of 30-40,000t This view was not universal. Many fishers were of the strong view that any limited fishery in 1999 be allocated to small boat fishers (<35').

Many fishers expressed the view that the ecosystem is out of balance due to the growing populations of seals. They now report seeing seals year round in many areas where in the past seals were only seasonally present and in many areas where they had never been observed in the past. Fishers stated that seals are "belly-feeding" on cod eating only internal organs and many mature cod are being destroyed. Fishers recommended that immediate culling be authorized in areas were seals are observed to be destroying mature cod in large numbers. Fishers are strongly of the view that the balance of evidence is that the seal population must be reduced immediately in order for the cod resource to have a any chance of recovery.

ANALYSIS:

The 1999 DFO Stock Status Report indicates that:

- Biomass of shelf components of the stock remain near all time lows. There has been little improvement in stock biomass or age structure. The 1994 age class remains the strongest. Natural mortality remains high for all age classes. Few fish older than age 5 have been found in 3K and 2J in recent years.
- The coastal components are stronger and comprised of several relatively strong year classes, with the 1990 year class the strongest. Further south in 3L the 1989 year class is also strong, as in 3Ps. Mark-recapture experiments indicate a mean biomass of 52,000t in 3K and northern 3L, and an additional biomass of no more than 15,000t in southern 3L (an independent review of these estimates indicated significant bias could be present in these calculations).

COUNCIL'S VIEWS ON STOCK STATUS:

Overall indicator:	very low; signs of improvement in 3L
	Compared to average
Spawning biomass:	very low
Total biomass:	very low
Recruitment:	poor on shelf; improving in coastal areas
Growth/Condition:	growth improving, condition good
Age structure:	poor on shelf; improving in coastal areas
Distribution:	improving in southern coastal areas, still abnormal
Recent exploitation:	low

- Coastal and shelf stock components currently differ in age structure. There is also evidence of diversity in population level genetic structure across the northern cod complex
- Significant concentrations and spawning biomass of cod (15-20,000t) overwinters and spawns in Smith Sound, Trinity Bay, as measured by acoustic surveys.
- The only known spawning area on the shelf at present is in the Hawke Channel in 2J.
- Age at maturity remains low
- Mean weight at age for 5 year olds has increased in all regions from the lows of the early 1990s
- Sentinel gill net CPUE has increased by a factor of 3 since 1995 in 3KL
- Sentinel line trawl CPUE declined in 1998 after increases in previous years.
- Juvenile surveys indicate that the order of the year class strength is 94>95>98>97>96.
- Predation by seals has been a serious source of mortality of cod since the moratorium.

The FRCC makes the following observations in relation to this stock:

The data available and methods presented in the SSR are inadequate as a basis for a scientific assessment and setting of a TAC for this stock. In particular, there is little information on the coastal components, which currently comprise the majority of the stock biomass. It is imperative that appropriate surveys be implemented immediately to assess the absolute abundance of cod in the coastal region.

The only method that has proven successful in providing abundance estimates of cod in coastal Newfoundland waters has been acoustic surveys conducted during the prespawning and spawning period in winter and spring. Hence, it is recommended that a winter-spring acoustic survey be implemented in the year 2000 with the goal of estimating total coastal biomass. A fall acoustic survey is not recommended and should not be repeated.

Mark-recapture experiments may supplement acoustic estimates and provide an additional means of estimating biomass. However, to be effective, mark-recapture experiments must be based on adequate sample sizes and take into account patterns of fish mixing and the fishery. The FRCC recommends that a large scale tagging program be undertaken immediately in 2J, 3K and 3L. Sentinel fishermen should play a role in fish tagging. The FRCC does not accept the argument that only DFO technicians and other trained scientists are capable of tagging fish in an appropriate manner.

Total removals from this stock may be underestimated as a consequence of unreported landings. The FRCC believes that removals must be more closely monitored

The sentinel fishery data provide a useful index of stock distribution and may provide information on abundance. This program should be continued. The FRCC notes that gill net catch rates in 3L and 3K are as high as in 3Ps, and that small mesh surveys in the northern areas (2J) show increasing numbers of young fish, likely 1994 and younger year classes.

Independent studies indicated substantially higher biomass levels in the coastal components. These estimates have provided useful information on stock distribution and status, but as with the mark-recapture results, do not form a basis for assessment of the coastal portion of this stock. These studies were reviewed by an independent scientific panel outside the normal stock assessment process.

Genetic studies suggest that coastal populations in Conception, Trinity, and Bonavista Bays are not genetically distinct, nor do they differ from cod in Placentia Bay (3Ps). Coastal populations show broad scale dissimilarity from shelf components, but at smaller scales these dissimilarities are inconsistent. These differences are derived from statistical analyses of allele frequencies. Hence, individual fish from distinct putative populations may not differ. There is inconclusive evidence that differences are stable over time.

Smith Sound, Trinity Bay is the site of a large over-wintering and spawning aggregation of cod. This aggregation may be key to the re-population of this area and perhaps beyond. It is very important that this aggregation be protected by a closure of directed fishing for groundfish in the sound.

The only known concentration of fish on the shelf occur in the region of the Hawke Channel in 2J. This concentration consists mainly of the 1994 year class, and with that year class now maturing at age 5, is the strongest possibility for a rebuilding of the shelf components. Hence, mortality from all sources must be kept as low as possible in this region. It is not known if these fish will begin to migrate shoreward at age 5, but to date no shoreward migration has been observed.

Fishermen have a wide range of views about the state of this stock. There is unanimous agreement only on the shelf components, which are at all time lows. All surveys and industry reports are consistent with this view. Northern coastal components are also very depressed. However, there is disagreement on the state of southern (3K and 3L) coastal components. Many fishermen believe that these components have rebuilt sufficiently to allow for a much larger commercial fishery, exceeding 20,000t or perhaps even more. However, other fishermen are more cautious, and believe that while there are dense aggregations of cod in the coastal region, these aggregations are discrete and do not comprise sufficient biomass to sustain such a fishery.

The mark recapture analyses suggest that the mortality generated by the fishery in 1998 was of the order of 5%. The FRCC would regard this as an acceptable level of mortality given the rebuilding status of the stock complex and the goal of re-establishing a fishery.

The setting of a TAC for this stock cannot be done in a defendable scientific manner as is the typical procedure for FRCC stocks. This is especially difficult given the diverse views on this stock. Hence, the recommended strategy to re-establish a minimal fishery is to use a "rule of thumb" indicator based on the best estimates available, and to scale those with the sentinel catch rates. According to the sentinel gillnet fishery results the stock has expanded at a rate of about 1.52 per year. The expansion rate indicated by the line trawl sentinel fishery catch rates is more modest at a multiple of 1.03 per year.

We assume that the actual total removals in 1998 could be in the order of 6,000t. The extent of high catch rates in the fisheries suggests that cod may be more widespread and abundant in coastal areas than indicated in the SSR, and this view has been highlighted in an additional scientific study. This procedure indicates a TAC of between 6,000t and 9,000t. This procedure recognizes all sources of information from the SSR, additional scientific advice, the sentinel and index fisheries, and the views of fishermen and industry.

The method of setting the TAC is regarded by the FRCC as a default method put forth only because of the unacceptable lack of quantitative data on the coastal biomass. The FRCC believes that it will be impossible to provide future recommendations on this stock unless quantitative data are provided on coastal abundance.

COMMENTS ON NORTHERN COD FRCC RECOMMENDATIONS:

The goal for this stock is to rebuild the full stock complex across the historic range from Hamilton Bank (2J) to the north Cape of the Grand Bank (3L), including both coastal and shelf spawning components. At present, most of the stock biomass occupies the coastal zone. There is increasing evidence of genetic substock structure within the northern cod stock complex, and that the existing aggregations may comprise distinct coastal populations. Indeed, the historical evidence for "seeding" of the more northerly coastal and shelf regions by coastal cod is not compelling. Nevertheless, stock expansion cannot be ruled out, has been observed in other fish stocks, and is considered to be more likely at larger stock sizes. Hence, the FRCC believes that in keeping with the overall goal for this stock, room for growth in existing populations must be encouraged. Another consideration is that shelf components historically migrated to the coastal zone in spring and summer. Indeed, this migration supported the large coastal fishery since the mid-1500s. The rebuilding of these shelf components is critical to the long-term prosperity of coastal communities and will depend on the lowest possible mortality rates being inflicted on these migratory stock components. Hence, the potential effects of a mixed-stock summer coastal fishery on the rebuilding shelf components must be acknowledged.

The FRCC also recognizes the importance of re-establishment of a small vessel coastal fishery in Newfoundland, in terms of the continuance of fishing skills and economic patterns, and the provision of scientific data through catch reporting and tag returns. Ideally, we might not fish at all as the best rebuilding strategy. However, the advantages of reopening a limited fishery are compelling. For example, the provision of data on distribution, catch rates, and age structure can benefit from a fishery. A tagging program requires a fishery. The FRCC believes that the sentinel fishery in particular must be continued and that, furthermore, all removals from this stock complex must be utilized to the maximum extent possible in terms of improving knowledge, and does not support removals that do not.

APPENDIX 1:

GROUNDFISH CONSULTATIONS

GROUNDFISH STOCKS IN SUB-AREAS 0,2+3 (EXCEPT 3PS AND COD)

LETTER TO STAKEHOLDERS

September 14, 1998

To Stakeholders:

The Fisheries Resource Conservation Council (FRCC) will be holding public consultations to gather information on Sub-Areas 0, 2 +3 (except 3Ps) stocks other than cod on October 7 and 8, 1998. This will assist the FRCC in making recommendations to the Minister of Fisheries and Oceans for 1999 conservation requirements. The Council will conduct further consultations in November on 3Ps stocks (except cod) once it has received and reviewed DFO's scientific assessments.

Consultations will be held at 9:00 A M on October 7 in Grand Falls/Windsor at *the Mount Peyton Hotel* and October 8 in Clarenville at *the Clarenville Inn*. Discussion will be limited to the following stocks:

HADDOCK	(3LNO)
REDFISH	(2+3K)
AMERICAN PLAICE	(2 + 3K)
WITCH FLOUNDER	(2J3KL)
GREENLAND HALIBUT (TURBOT)	(0B+1B-F, 2+3)
SKATE	(3LNOPs)
ROUNDNOSE GRENADIER	(0, 2+3)
LUMPFISH	

Stakeholders may make public presentations by way of oral presentation or by providing the FRCC with a written brief at P.O. Box 2001, Station D, Ottawa,ON K1P 5W3, phone (613) 998-0433, fax (613) 998-1146 or via Internet: www.ncr.dfo.ca/frcc.

Your participation at these consultations is important and we look forward to hearing your views.

Fred Woodman

Fred Woodman
Chairman

QUESTIONS FOR DISCUSSION AT CONSULTATIONS

3LNO HADDOCK

For both 1996 and 1997 the Council had recommended that there be no directed fishing for this stock and that bycatches be limited to 100t. At consultations for 1998, it was noted that bycatches were increasing and fishers, not wishing to see other fisheries closed because of increased haddock bycatch, believed that the bycatch limit should be increased to 500t for 1998. The Council subsequently recommended no directed fishery and that the standard bycatch protocols be applied when fishing other species. Bycatches to September 2 are only 75t. Is this an indication that the stock is in worse shape than believed? What have you observed when fishing for other species in this area?

2+3K REDFISH

At the consultations for 1998 it was noted that there were no indications of good recruitment and that when recruitment does occur, it would require a minimum of 10 years before it would contribute to any fishery. Have you noticed anything that might indicate a change in status for this stock?

2+3K AMERICAN PLAICE

During consultations for the 1998 fishery, it was noted that prospects for rebuilding this stock in the foreseeable future were poor. The Council continued its recommendation that there be no directed fishery for this stock and that cooperative science-industry surveys be developed to increase the data base. Were such surveys carried out? Have you noticed anything that might indicate a change in status for this stock?

2J3KL WITCH FLOUNDER

Council recommendations for 1998 were the same as for American plaice. During consultations for 1998 it was noted that the stock was at the lowest level ever observed. Were any joint science-industry surveys carried out in 1998? Is there any improvement in the status of this stock? Have you noticed anything that might indicate a change in status for this stock?

0B+1B-1F GREENLAND HALIBUT

During consultations in 1997, many concerns were expressed about the deepwater gillnet fishery. For 1998 the Council made a number of recommendations concerning management measures that should be implemented for this fishery. It was recommended that a limitation be set on the number of gillnets to a level that could be handled in a period of time that would minimize waste due to quality deterioration and measures be implemented to reduce net loss and the associated ghost fishing. Were the limitations outlined in the Conservation Harvesting Plans low enough? Were adequate measures put in place to ensure reduced net loss? Were observers placed on enough vessels to get an adequate information on soak times, discard levels, adherence to net limits, net loss and any other information that will be useful in future decision making.

Otter trawlers were limited to a minimum mesh size of 155 mm square mesh. Is this size adequate to protect juvenile fish? Were any closures of spawning or nursery areas implemented in 1998? Do you think we should be working towards less gillnets and more long lines in this fishery?

2+3 GREENLAND HALIBUT

There has been some controversy over the minimum mesh size in this, and the Sub-Area 0, fishery. The current mesh size for trawls is 155 mm diamond or 165 mm square in the codend. Is this mesh size adequate to protect juvenile fish? There have also been reports of considerable bycatches of Greenland halibut in the shrimp fishery in this area - what is the magnitude of these catches?

SUB-AREA 0 ROUNDNOSE GRENADIER

Since 1995, the Council has recommended that there be no directed fishing for this stock. Is there any reason to change this recommendation for 1999?

SUB-AREA 2+3 ROUNDNOSE GRENADIER

Since 1996 there has been no directed fishing for this stock. Is there any reason to change this recommendation for 1999?

3LNOPs SKATES

The skate fishery in many areas is conducted almost entirely in small concentrated areas. Have other areas been explored? Has there been a decrease in the size of the fish in your catch?

FLATFISH AND FLOUNDERS

There has been talk of a minimum mesh size for deepwater flounder. What, in your opinion should this size be?

LUMPFISH

A number of measures have been implemented in recent years to control effort, i.e. less nets, shorter season, etc. In your opinion have these been successful in reducing the decline of this stock?

OTHER STOCKS

Are there other groundfish stocks found in Sub-Areas 2+3 (other than NAFO-managed stocks or those found in 3P) that the Council should be concerned about?

GENERAL

During any 1998 fishery (i.e., crab, shrimp, scallops, skate, etc.) what has been your general observations on the fishing grounds?

BRIEFS RECEIVED FOR CONSULTATIONS

FRCC.98.GR-NF1	Captain Clarence Cabot - Mt. Pearl, Newfoundland
FRCC.98.GR-NF2	Mr. Peter Corcoran - St. Mary's Bay, Newfoundland
FRCC.98.GR-NF3	Groundfish Enterprise Allocation Council - Ottawa, Ontario

SCOTIAN SHELF AND BAY OF FUNDY, REDFISH AND SUB-DIVISION 3PS GROUNDFISH STOCKS

LETTER TO STAKEHOLDERS

October 13, 1998

Letter to Stakeholders:

The Fisheries Resource Conservation Council (FRCC) will hold public consultations to seek stakeholders' views on Scotian Shelf and Bay of Fundy groundfish stocks, redfish stocks, and 3Ps groundfish stocks other than cod. This information will assist the FRCC in making recommendations to the Minister of Fisheries and Oceans for 1999 conservation requirements.

Newfoundland meetings will be held November 16 in Harbour Breton at the Lion's Club and November 17 in Clarenville at the Lion's Club. Meetings in Nova Scotia will take place November 18 in Sydney at the Cambridge Suites Hotel, November 19 in Halifax at the Bedford Holiday Inn, Kearney Lake Road, and November 20 in Shelburne at the Firehall.

Discussion will center around the following stocks:

COD	(4VsW, 4Vn (M-O), 4X)	ATLANTIC HALIBUT	(3NOPs4VWX5Zc)
HADDOCK	(3Ps,4TVW,4X)	POLLOCK	(3Ps, 4VWX5Zc)
SKATE	(4VsW, 3LNOPs)	WOLFFISH	(4VWX)
WHITE HAKE	(4VWX5zC)	SILVER HAKE	(4VWX)
CUSK	(4VWX)	MONKFISH	(4VWX)
AMERICAN PLAICE	(3Ps)	WITCH FLOUNDER	(3Ps)
FLATFISH	(4VW,4X)	ARGENTINE	(4VWX)
REDFISH	(Units 1,2,3 & 30)		

Meetings will begin at 9:00 AM. The meeting in Halifax November 19 will focus primarily on Scotian Shelf and all redfish stocks and will be of interest to those in the Gulf of St. Lawrence area, though stakeholders are welcome to comment on redfish at any of the meetings. Participants at the Halifax meeting can also address any of the above stocks.

DFO Science will conduct a full zonal assessment of 2J3KL, 3Ps, 4TVn and 4Rs3Pn cod in early 1999 which will include the results of research surveys, and sentinel, commercial and index fisheries. Following this, the FRCC will hold a full round of public consultations prior to forming its advice to the Minister.

Presentations to the FRCC may be made by way of oral presentation at any meeting or by providing a written brief to the FRCC at P.O. Box 2001, Station D, Ottawa, ON K1P 5W3,

phone (613) 998-0433, fax (613) 998-1146, internet www.ncr.dfo.ca/frcc.

The success of these consultations is important to all stakeholders and the Council hopes you will participate fully.

Fred Woodman
Chairman

QUESTIONS FOR DISCUSSION AT CONSULTATIONS

SCOTIAN SHELF AND BAY OF FUNDY GROUNDFISH STOCKS

What comments/observations do you have with respect to species mix of cod, haddock, and pollock in the past?

What comments/observations do you have with respect to geographical distribution of groundfish resources on the Scotian Shelf and in the Bay of Fundy in 1998?

Was dumping/discarding a significant problem in 1998? Would you say that there was more dumping this year than in the previous three years?

Has there been a shift in effort to harvest groundfish resources in the past year? If so, describe.

What comments do you have with respect to recruitment (or lack of) in cod, haddock, pollock and flatfish resources in 1998?

The FRCC recommended that there be an industry/government survey for Atlantic halibut in 1998 to assist in the assessment of this stock. What is your view of the implementation of the survey and its results? Should the survey be continued in future?

How does your fishing experience or the survey results for Atlantic halibut affect your view of the resource?

What other conservation measures would you recommend for fisheries in your area?

With your knowledge of the fishery, as a rebuilding strategy, do you think the 1998 TACs were set a) too low; b) at the right level; or c) too high?

Do you think that closed areas (e.g., Browns Bank) are an effective way to conserve cod and haddock stocks? Should this area be expanded? Should there be fishing on spawning concentrations? Can we identify spawning areas and times?

REDFISH UNITS 1,2,3 & 3 O

In keeping with the FRCC mandate to rebuild stocks, over the past four years, the FRCC has recommended reduced quotas, closures, increased mesh size and small fish protocols. Keeping in mind this mandate, have measures been adequate/effective in rebuilding stocks?

The FRCC, in its letter to the Minister on science priorities for the department of Fisheries and Oceans, called for better cooperation between the regions on redfish research. Are there specific issues you feel that need to be addressed, such as research priorities, for redfish?

Two years ago, the FRCC requested that initiatives (e.g., sentinel fishery, tows for science) be undertaken to improve and expand the information on redfish stocks, particularly in Unit 1 where there has been a moratorium in place since 1995. Has this been adequate to address these concerns? Should more be done in future?

Does the scientific information provided for Units 2 and 3 and NAFO Division 3 O compare with your experience in fishing these stocks over the past few years? If not, how does it differ?

Has fishing for redfish improved in Unit 2? Is a 11,000 t TAC offering stability in this fishery, is it allowing for rebuilding, or are stocks continuing to decline? Are other measures needed to protect the 1988 year class?

In previous years there have been reports of significant catches of small redfish in Unit 3. Has the small fish protocol been effective and have landings of small redfish been adequately monitored? Should we expand the size of the closed area for juvenile redfish to include other areas such as the Western Hole?

Two years ago, the FRCC recommended gear modifications to reduce the capture of small redfish in 3O. Has this happened? What are the results you have observed from gear modifications?

Catches of juvenile and undersize fish are a problem, should we be increasing minimum fish size and increasing mesh size, especially in 3O and Unit 3?

Should we be looking at closed areas to avoid capture of small fish and bycatch?

3Ps STOCKS

Last year we recommended no directed fishery for both pollock and haddock in 3Ps. What have your observations been with respect to this fishery? Are bycatch levels higher or lower than in the past?

Fishermen are having problems with bycatch levels, especially pollock in the hake fishery. Should we be setting bycatch levels as a percentage of a directed fishery?

BRIEFS RECEIVED FOR CONSULTATIONS

November 16, 1998 - Harbour Breton, Nfld.

FRCC.98.GR.NF6	Eric Day, F.F.A.W.U.

November 17, 1998 - Clarenville, Nfld.

FRCC.98.GR.NF5	Alistair O'Rielly, Fisheries Assoc. of Nfld. and Lab. Ltd.
FRCC.98.GR.NF7	Fish, Food and Allied Workers Union

November 18, 1998 - Sydney, N.S.

FRCC.98.GR.SF8	Herbert F. Nash, Glace Bay, N.S.

November 19,1998 - Halifax N.S.

FRCC.98.GR.SF9	Brian Giroux, Scotia Fundy Mobile Gear Fishermen's Assoc.
FFRC.98.GR.SF.10	Maria Recchia, SWNB Fixed Gear Management Board
FRCC.98.GR.SF11	Nellie Baker, Eastern Shore Fishermen's Protective Assoc.

November 20, 1998, - Shelburne, N.S.

FRCC.98.GR.SF.12	Gary Dedrick, <45 Shelburne County Fixed Gear Quota Group
FRCC.98.GR.SF.13	Ewan L. Walters, Scotia Fundy Inshore Fishermen's Assoc.
FRCC.98.GR.SF.14	Ewan L. Walters, Silver Hake Advisory Committee
FRCC.98.GR.SF.15	Claude D'Entremont, Inshore Fisheries Ltd.
FRCC.98.GR.SF.16	Pamela R. Decker, Shelburne County Competitive Fishermen's Assoc.
FRCC.98.GR.SF.17	George Rennehan, Nova Scotia Fixed Gear 45-65' Assoc.
FRCC.98.GR.SF.19	Brian Giroux, Scotia Fundy Mobile Gear Fishermen's Assoc.

Briefs Received by Mail

FRCC.98.GR.SF1	Sylvain D'Eon, D'Eon Fisheries Ltd., West Pubnico, N.S.
FRCC.98.GR.SF2	Klaus Sonnenberg, Grand Manan Fishermen's Assoc. Ltd. Grand Harbour N.B.
FRCC.98.GR.SF3	Frank D'Entremont, Lower West Pubnico, Yarmouth Co. N.S.
FRCC.98.GR.SF4	Hubert E. Saulnier, Saulnierville N.S.
FRCC.98.GR.NF.18	Rex Simmons, A.M.P. Fisheries Ltd., Paradise Nfld.
FRCC.98.GR.SF.20	Ewan Walters, Scotia Fundy Inshore Fishermen's Assoc.
FRCC.98.GR.SF.21	David Bollivar, Seafreeze Foods Inc.
FRCC.98.GR.SF.22	W A Williams, SW Nova Fixed Gear Association, Lockeport, N.S

GULF OF ST. LAWRENCE GROUNDFISH STOCKS AND COD IN DIVISIONS 2GH AND 3PS

LETTER TO STAKEHOLDERS

March 9, 1999

LETTER TO STAKEHOLDERS:

The Fisheries Resource Conservation Council (FRCC) will hold public consultations to gather information from stakeholders on Gulf of St Lawrence groundfish stocks and both 3Ps and 2J3KL cod. This information will assist the Council in making recommendations to the Minister of Fisheries and Oceans for 1999 conservation requirements.

FRCC teams will hold consultations at 9:00AM in the following locations:

APRIL 6	GASPÉ, QC (*QUALITY INN*) PORT-AU-CHOIX, NF (*TOWN COUNCIL OFFICE*)
APRIL 7	ILES DE LA MADELEINE, QC (*AUBERGE MADELI*) PORT-AUX-BASQUES, NF (*ST. CHRISTOPHER'S HOTEL*)
APRIL 8	MONCTON, NB (*HOTEL BEAUSÉJOUR*) GRAND FALLS, NF (*MOUNT PAYTON INN*)
APRIL 9	PORT HAWKESBURY, NS (*NAUTICAL COLLEGE*) CLARENVILLE, NF (*WINTER GAMES COMPLEX* - 2J3KL COD, 9:00AM; 3PS COD, 1:00PM)

Discussion will center around cod stocks in 2J3KL, 3Ps, 4RS3Pn, and 4TVn, 4T American plaice, 4T white hake, 4T yellowtail flounder, 4T winter flounder, 4RST witch flounder, 4RST Greenland halibut, and 4RST Atlantic halibut. To help focus the discussion, the FRCC has prepared a series of questions attached for your consideration. Stakeholders are invited to make public presentations by way of oral presentation or by providing a written brief to the FRCC at P.O. Box 2001, Station D, Ottawa, ON K1P 5W3, (613) 998-0433 phone, (613) 998-1146 fax, or info@frcc.x400.gc.ca. Written submissions should be provided by April 9 as the Council will be formulating its advice to the Minister the following week.

The Council has asked DFO Science to present its current assessments for these stocks at the consultations. The meetings will give stakeholders an opportunity to comment on these stocks prior to forming its advice to the Minister.

As always, the views of stakeholders are important to the FRCC and we hope you will participate fully.

Fred Woodman
Chairman

QUESTIONS FOR DISCUSSION AT CONSULTATIONS

2J3KL COD

What were your observations from the Index Fishery in 1998 (catch rates, size and condition of fish)? Were the fish where you expected to find them (traditional grounds) or elsewhere? Did you have any problem in catching your quota? Did you observe seals in your area? If so, were they more or less abundant than in 1997 and did they stay longer?

Based on sentinel and index fisheries and offshore surveys there is not good geographical distribution of cod in 2J3KL. What would be the long-term impact of a limited commercial or index fishery on the sustainability of the resource, particularly if catches were primarily from the southern portion of the stock range?

3Ps COD

In 1998, were cod more or less abundant than in 1997? How did your catch rates compare? What was the size and condition of fish? Was there good geographical distribution of your catch? Did you observe seals in your area? If so, were they more or less abundant than in 1997?

4TVn COD

Opportunities to observe the cod resource in 1998 were limited to sentinel, index and recreational fisheries and restrictive bycatches in other directed fisheries. On the basis of these indicators, what comments do you have regarding distribution of the resource, size run in the catches, indications of incoming recruitment, physical condition of the fish and the presence of prey/bait species for cod?

4RS,3Pn COD

From the limited commercial fishery in this area, what have you observed, particularly in regards to distribution of the resource, size run in the catches, indications of incoming recruitment, physical condition of the fish and presence of prey/bait species for cod?

4T WHITE HAKE

Opportunities to observe the hake resource in 1998 were limited to sentinel, index and recreational fisheries and restrictive bycatches in other directed fisheries. On the basis of these indicators, what comments do you have regarding distribution of the resource - any observations on catches of hake in areas other than St. Georges Bay, size run in the catches, indications of incoming recruitment, physical condition of the fish, presence of prey/bait species for hake and any observations on catches of juveniles?

4T AMERICAN PLAICE

In recent seasons it has been reported that catch rates remain at or near traditional levels in some grounds (principally in the eastern portion of 4T) and are sharply reduced from traditional levels at other locations (principally in the western portion of 4T). Survey results show the same pattern. What are your observations regarding the distribution of the resource in 1998? To what extent do bycatch restrictions on cod interfere with your ability to target plaice? What was the physical condition of the fish observed in the 1998 fishery?

4T WINTER FLOUNDER

Recent catch rates and survey results both indicate that the abundance and status of this resource varies between different parts of 4T. What were your observations regarding distribution and abundance in 1998? Was there any further re-direction of effort toward winter flounder in 1998? Many fishermen believe there to be distinct stocks of flounder in 4T. What suggestions do you have for what areas may be distinct? Any suggestions for additional research work?

4RST WITCH FLOUNDER

Fishermen reported large catches in the autumn of 1998. There were quota over-runs due to high catch rates. What were fishermen observing and where? ? Also what observations do you have regarding size of the fish, etc?

4RST ATLANTIC HALIBUT

What observations do you have regarding the state of this stock? What size, stock distribution, etc. have you observed?

4RST GREENLAND HALIBUT

In your experience what is the status of this stock in comparison to the fishery in the past ten years? How do catch rates per net compare in 1998 to past years when the fishery was conducted with 5.5-inch mesh as opposed to the current 6-inch mesh size? Should the mesh size be increased beyond 6 inches?

RECREATIONAL FISHERY

The recreational fishery has been very controversial. In your opinion should this type of fishery be permitted to continue in areas where there is no directed commercial fishery?

SCIENCE

The FRCC is mandated to provide the Minister of Fisheries and Oceans with recommendations on DFO science priorities. Are there specific issues you feel that need to be addressed, as research priorities, for the above stocks or any other groundfish stocks in the Gulf of St. Lawrence or Newfoundland? Are there priorities that you believe industry and Science can work on in partnership? How can the sentinel fishery be improved to provide additional information for Science?

BRIEFS RECEIVED FOR CONSULTATIONS

April 6, 1999 - Gaspé, PQ

FRCC.99.GR.PQ.8	Jacques Gosselin, Tous les pêcheurs de Cap Chat,P.Q.
FRCC.99.GR.PQ.9	Daniel Vallée, Président, Regroupement des pêcheurs professionnels du Nord de la Gaspésie PQ.
FRCC.99.GR. PQ.10	MORUE, mobilisation régionale pour l'urgence de l'emploi PQ.
FRCC.99.GR. PQ.11	Pierre Chevrier, Président du R.P.P.U.M., P.Q.

Port-aux-choix, NF

FRCC.99.GR.NF.13	Mr.Winston Mercer, Chairman - Fishermen's committee, Upper Island Cove, Nfld
FRCC.99.GR.NF.14	Fishermen's Committee of Coachman's Cove,Nfld.

April 7,1999 - Iles de la Madeleine.

FRCC.99.GR.PQ.12	A.P.P.I.M.

April 8,1999 - Moncton, NB

FRCC.99.GR.NB.15	Brian Stevens, Seafood Processors Assoc. of P.E.I.
FRCC.99.GR. NB.16	Association des Pêcheurs de Poisson de Fond Acadiens (Zone 4T-1999)
FRCC.99.GR.NB.17	John H. Banks, Souris, P.E.I.

April 9,1999 - Port Hawkesbury, NS

FRCC.99.GR.NS.19	Gerard MacEachern, Director - Gulf Groundfish Federation
FRCC.99.GR.NS.20	Mobile Fishers - Cheticamp - Bay St. Lawrence
FRCC.99.GR.NS.21	Ronald E. Heighton, President - Northumberland Fishermen's Association
FRCC.99.GR.NS.22	Groundfish Enterprise Allocation Council
FRCC.99.GR.NS.38	Clifford Aucoin - Northern Cape Breton Fishing Vessel Association

Clarenville, NF

FRCC.99.GR.NF.23	Earle McCurdy - Fish, Food and Allied Workers Union
FRCC.99.GR.NF.24	Earle McCurdy - Fish, Food and Allied Workers Union
FRCC.99.GR.NF.25	Brian Phillips - Inshore Fishermen's Improvement Committee
FRCC.99.GR.NF.26	Thomas E. Best, Co.Chair - Eastern Avalon/Southern Shore <35' Vessels Fish Harvesters Association
FRCC.99.GR.NF.27	John Hewitt, Fishing Industry Representative - Irish Loop Regional Economic Development Board
FRCC.99.GR.NF.28	The Southern Shore Fish Harvesters Action Committee
FRCC.99.GR.NF.29	Brian Walsh - Coalition of Under 35 ft. Concerned Fishermen's Committee for 3L Area

FRCC.99.GR.NF.30	Hayward Pike - Charleston, NF.
FRCC.99.GR.NF.31	Bill Broderick, Fisherman - St. Brendans, Bonavista Bay, NF
FRCC.99.GR.NF.32	Dr. George Winters - Focus Technologies Inc.
FRCC.99.GR.NF.33	Dr. George Winters - Focus Technologies Inc.
FRCC.99.GR.NF.34	Fisherpeople of Hermitage, Seal Cove, Gaultois & McCallum
FRCC.99.GR.NF.35	Fishery Product International
FRCC.99.GR.NF.36	Earle McCurdy - Fish, Food and Allied Workers Union
FRCC.99.GR.NF.37	Earle McCurdy - Fish, Food and Allied Workers Union
FRCC.99.GR.NF.39	Earl Johnson, Fisherman 3Ps, Placienta Bay, NF

Briefs Received by Mail

FRCC.99.GR.NF1	John Osmond, Mgr. Eric King's Fisheries Ltd. and Joanne Butland, St. Lawrence Seafoods Ltd. Nfld.
FRCC.99.GR.NF2	Fred Winsor (PhD.) St. John's, Nfld.
FRCC.99.GR.NB.3	Denis Robichaud, APPFA Inc. NB.
FRCC.99.GR.NS.4	Clifford Aucoin, President, NCBFVA.
FRCC.99.GR.NF5	Dawson Martin, Fisherman, Bonavista, Nfld.
FRCC. 99.GR.NF6	Brian Grandy, Member of Action Committee 3Ps larger boats.
FRCC.99.GR. NF.7	Austin Zucker, Fisherman, English Harbour, Nfld.
FRCC. 99.GR.NF.18	Carl Parsons, Clarke's Beach, Nfld.
FRCC. 99.GR.PQ40	Position de l'Alliance lors de la Consultation du CCRH pour la pêche à la morue dans le Golfe St-Laurent_.P.Q.
FRCC.99.GR.NS.41	Inshore Fishermen's Concern 4T American Plaice N.S.
FRCC.99.GR.PQ.42	L'Alliance des pêcheurs professionnels du Québec P.Q.
FRCC.99.GR.Nf.43	Industry Results from Area 3L Offshore Surveys, Northern.(2J3KL) N.F.
FRCC.99.GR.NF.44	Industry Results from Areas 2J and 3K Offshore Surveys NF.

Fisheries Resource Conservation Council

GEORGES BANK GROUNDFISH STOCKS

LETTER TO STAKEHOLDERS AND QUESTIONS FOR DISCUSSION

April 26, 1999

Dear Stakeholder:

The Fisheries Resource Conservation Council (FRCC) will hold its annual public consultation on May 11, 1999 at 9:00 A.M. at the RODD GRAND HOTEL in Yarmouth, Nova Scotia to gather information on Georges Bank groundfish stocks. Your views will assist us in providing advice to the Minister of Fisheries and Oceans regarding conservation requirements for Georges Bank haddock, cod and yellowtail flounder.

At the consultation, the Department of Fisheries and Oceans (DFO) will present new information on the three stocks from this year's stock status reports. As always, stakeholders are invited to make a presentation at the meeting or provide us with a written brief: Fisheries Resource Conservation Council, P.O. Box 2001, Station D Ottawa, ON, K1P 5W3, (613) 998-0433 phone, (613) 998-1146 fax.

The FRCC has produced the following questions to help focus the discussion:

1 The ITQ mobile fleet experienced yellowtail catch rates in the later months (Nov, Dec) in 1998 which were lower than the previous 2 years (same months). Do you think this is indicative of stock abundance, stock distribution over the area, or some other cause?

2 We have observed a strong recruitment signal for both yellowtail and haddock on Georges Bank, however cod recruitment is negligible. What could be the possible causes of this situation?

3 Catch rates from commercial fisheries on Georges Bank are calculated and reviewed by Science. However, these catch rate series are not currently used as indices of abundance in the stock assessments. Do you think that these data should be used explicitly?

4 Based on your knowledge of Georges Bank, are we at a comfortable level of biomass? What rebuilding threshold should we be seeking to reach?

5 How can we best enhance rebuilding of the stocks, e.g., fish at F0.1 or less, ensuring more spawners and larger fish are left to produce adequate recruitment?

6 Were last year's FRCC recommendations appropriate to allow a clean fishery without dumping and discards?

7. Should there be additional conservation measures in this fishery and what should they be?

The FRCC is committed to the continued rebuilding of Georges Bank groundfish stocks. Your views are important and we hope you will participate.

Fred Woodman

Fred Woodman
Chairman

BRIEFS RECEIVED FOR CONSULTATIONS

A. Briefs Received by Mail

FRCC. 99.5Z.-1	Groundfish Enterprise Allocation Council, Gloucester, Ont.
FRCC. 99.5Z.-2	South W est Fishermen's Quota Group Association, Ronnie A. Newell

B. May, 1999 - Yarmouth, N. S

FRCC. 99.5Z.-3	Scotia Fundy Mobile Gear Fishermen's Assoc., Yarmouth, N.S.
FRCC. 99.5Z.-4	Inshore Fisheries Ltd., Yarmouth, N.S., Claude d'Entremont
FRCC. 99.5Z.-5	Scotia Fundy Inshore Fishermens Association, Barrington, N.S., E.L. W alters
FRCC. 99.5Z.-6	The Gulf of Maine Advisory Committee, P.E. Partington

APPENDIX 2:
MANDATE OF FRCC

FRCC TERMS OF REFERENCE

1. INTRODUCTION

The Government of Canada is committed to a more comprehensive approach to the conservation and management of our fisheries resource. This approach demands a better understanding of complex fisheries ecosystems - the interaction of fish with other species, predator-prey relationships, and also changes in the marine environment like ocean currents, water temperatures and salinity.

The Government of Canada is also committed to a more effective role in decision-making for those with practical experience and knowledge in the fishery.

The Minister of Fisheries and Oceans has established the Fisheries Resource Conservation Council (FRCC) as a partnership between government, the scientific community and the direct stakeholders in the fishery. Its mission is to contribute to the management of the Atlantic fisheries on a 'sustainable' basis by ensuring that stock assessments are conducted in a multi-disciplined and integrated fashion and that appropriate methodologies and approaches are employed; by reviewing these assessments together with other relevant information and recommending to the Minister total allowable catches (TACs) and other conservation measures, including some idea of the level of risk and uncertainty associated with these recommendations; and by advising on the appropriate priorities for science.

2. DEFINITION OF CONSERVATION

Fisheries conservation is that aspect of the management of the fisheries resource which ensures that its use is sustainable and which safeguards its ecological processes and genetic diversity for the maintenance of the resource. Fisheries conservation ensures that the fullest sustainable advantage is derived from the resource and that the resource base is maintained.

3. COUNCIL OBJECTIVES

3.1 To help the government achieve its conservation, economic and social objectives for the fishery.The conservation objectives include, but are not restricted to:

  3.1.1 rebuilding stocks to their 'optimum' levels and thereafter maintaining them at or near these levels, subject to natural fluctuations, and with 'sufficient' spawning biomass to allow a continuing strong production of young fish; and,

  3.1.2 managing the pattern of fishing over the sizes and ages present in fish stocks and catching fish of optimal size.

3.2 To develop a more profound understanding of fish-producing ecosystems including the inter-relationships between species and the effects of changes in the marine environment on stocks.

3.3 To review scientific research, resource assessments and conservation proposals, including, where appropriate, through a process of public hearings.

3.4 To ensure that the operational and economic realities of the fishery, in addition to scientific stock assessments, are taken into account in recommending measures to achieve the conservation objectives.

3.5 To better integrate scientific expertise with the knowledge and experience of all sectors of the industry and thus develop a strong working partnership.

3.6 To provide a mechanism for public and industry advice and review of stock assessment information.

3.7 To make public recommendations to the Minister.

4. MANDATE AND SCOPE

4.1 The Fisheries Resource Conservation Council will address these objectives by bringing together industry, DFO science and fisheries management, and external scientific and economic expertise in one body.

4.2 The Council will:

- 4.2.1 advise the Minister on research and assessment priorities;
- 4.2.2 review DFO data and advise on methodologies;
- 4.2.3 consider conservation measures that may be required to protect fish stocks;
- 4.2.4 review stock assessment information and conservation proposals, including through public hearings, where appropriate; and,
- 4.2.5 make written public recommendations to the Minister on TACs and other conservation measures.

4.3 The Council may recommend any measures considered necessary and appropriate for conservation purposes such as TACs, closure of areas to fishing during specific periods, approaches to avoid catching sub-optimal sized fish or unwanted species, and restrictions on the characteristics or use of fishing gears.

4.4 The Council's scope includes Canadian fish stocks of the Atlantic and Eastern Arctic Oceans. In the first instance, the Council will address groundfish, and then subsequently take on responsibility for pelagic and shellfish species.

4.5 The Council is also responsible for advising the Minister on Canada's position with respect to straddling and transboundary stocks under the jurisdiction of international bodies such as the Northwest Atlantic Fisheries Organization (NAFO).

5. SIZE, STRUCTURE AND MAKE-UP

5.1 The Council will consist of not more than 14 members with an appropriate balance between 'science' and 'industry'.

5.2 Members are chosen on merit and standing in the community, and not as representatives of organizations, areas or interests.

5.3 'Science' members, are drawn from government departments, universities or international posts, and are of an appropriate mix of disciplines, including fisheries management and economics.

5.4 'Industry' members are knowledgeable of fishing and the fishing industry and understand the operational and economic impacts of conservation decisions.

5.5 All members of the Council are appointed by the Minister.

5.6 All members, including the Chairperson, are appointed for a three year term; terms can be renewed.

5.7 Members appointed from DFO serve 'ex officio'.

5.8 Members have to disclose any interest in the Atlantic or Eastern Arctic fishery and take appropriate measures so as to avoid potential or real conflict of interest situations during the term of appointment.

5.9 The four Atlantic Provinces, Quebec and the Northwest Territories may each nominate one delegate to the Council. These delegates have access to the Council's information, and may participate fully in meetings, but will not be asked to officially endorse the formal recommendations to the Minister.

5.10 The Council is supported by a small Secretariat, to be located in Ottawa. The Secretariat will:

- 5.10.1 provide administrative support for the functioning of the Council;

5.10.2 provide a technical science and fisheries management support;

5.10.3 organize Council meetings;

5.10.4 record decisions of the Council;

5.10.5 undertake a professional communications function for the Council, providing a central point for communications to and from the Council; and

5.10.6 undertake such other matters as from time to time might be appropriate.

5.11 The Chairman may appoint an Executive Committee, consisting of the Chairman, Vice-Chairman, and three other Members.

5.12 In addition, the Chairman may, from time to time, strike an 'ad hoc' committee to deal with a specific issue.

6. ACTIVITIES:

6.1 Reviews appropriate DFO science research programs and recommends priorities, objectives and resource requirements.

6.2 Considers scientific information - including biology, and physical and chemical oceanography, taking into account fisheries management, fishing practices, economics and enforcement information.

6.3 Conducts public hearings wherein scientific information is presented and/or proposed conservation measures/options are reviewed and discussed.

6.4 Recommends TACs and other conservation measures.

6.5 Prepares a comprehensive, long-term plan and a work plan for the Council which are reviewed annually at a workshop with international scientists and appropriate industry representatives.

6.6 Ensures an open and effective exchange of information with the fishing industry and contributes to a better public understanding of the conservation and management of Canada's fisheries resource.

APPENDIX 3:
FRCC MEMBERSHIP

FRCC MEMBERSHIP

CHAIRMAN: MR. FRED WOODMAN, NEW HARBOUR, NEWFOUNDLAND

Mr. Woodman has worked for more than 40 years in the fishery, first in the family fresh fish and saltfish business founded by his father and grandfather, F. Woodman and Son, and more recently as founder and president of Woodman Fish Products, New Harbour, Newfoundland. The Woodman name has been linked with the fishery in Newfoundland for more than 100 years.

Throughout his career, Mr. Woodman has held a number of positions including chairman of the Fisheries Council of Canada, and chairman of the Fisheries Association of Newfoundland and Labrador. He was also chairman of Newfound Resources Ltd., a consortium of inshore fish plant operators. Mr. Woodman has been a member of the FRCC since May 1993, participating actively in the work of several subcommittees. Mr. Woodman resides in New Harbour.

VICE-CHAIRMAN DR. JEAN-CLAUDE BRÊTHES, RIMOUSKI, QUÉBEC

A Professor of Oceanography at the Université du Québec à Rimouski since 1978, Dr. Brêthes' research interests lie in fisheries development, population dynamics and ecology, and coastal oceanographic processes. Dr. Brêthes has worked abroad on several projects, especially in Africa. Dr. Brêthes has conducted extensive research on various Atlantic fish stocks, and was one of four external members of the Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC).

MEMBERS

MR. OSBORNE BURKE, INGONISH, NOVA SCOTIA

Mr. Osborne Burke is a self-employed inshore groundfisherman in Ingonish, Nova Scotia. Mr. Burke is currently the director of various organizations throughout the Gulf and Scotia/Fundy regions in the Maritimes, including the North of Smokey Fisherman's Association, the Federation of Gulf NS Groundfishermen, the Gulf NS Fleet Planning Board, the North of Smokey Sealers Co-op and the Nova Scotia Fisheries RTTC. In addition to these organizations, Mr. Burke is also an executive member of the Eastern Fisherman's Federation and a member of the Harbour Authority Advisory Council.

MR. BRUCE CHAPMAN, ST. JOHN'S, NEWFOUNDLAND

Bruce Chapman is the Executive Director of the Groundfish Enterprise Allocation Council, an association of offshore groundfish operators. Mr. Chapman was President of the Fisheries Association of Newfoundland and Labrador (FANL), an organization of fish and seafood processors, President of Newfound Resources Limited, and Vice-President of the Fisheries Council of Canada. Mr. Chapman has also held senior positions at the Canadian Association of Fish Exporters (CAFE) and the Seafood Producers Association of Nova Scotia (SPANS).

Mr. Chapman has participated on several boards, including the Federal Task Force on Incomes and Adjustment in the Atlantic Fishery, the Advisory Committee of the Fisheries and Marine Institute of Memorial University of Newfoundland, the Northwest Atlnatic Fisheries Organization (NAFO) and the St. John's Board of Trade. Mr. Chapman holds a Bachelor of Arts and a Bachelor of Education from Memorial University.

MR. JEAN-GUY D'ENTREMONT, LOWER WEST PUBNICO, NOVA SCOTIA

Mr. d'Entremont is the owner-operator of Inshore Fisheries Ltd., a small-sized fish harvesting and processing company in West Pubnico, Nova Scotia. The company is a 50 year-old, third generation family business. Mr. d'Entremont has skippered an inshore dragger for seven years and has fished extensively in the Gulf of Maine and Georges Bank, as well as along the Scotian Shelf to Banquereau Bank, and around Sable Island.

MR. ERNSEST DESPRÉS, RIVIÈRE-AU-RENARD, QUEBEC

Mr. Després currently lives in Rivière-au-Renard, Quebec. Mr. Després is the vice-president of the Maritime Division of RT Ltd. Group and directs three fish plants: Rivière-au-Renard, La Tabatière and the Gaspé Aquaculture Centre. Throughout his career, Mr. Després has held senior positions in several fish processing plants. Since 1992, Mr. Després has been the president of l'Associations québecoise de l'industrie de la pêche. Mr. Després has also participated in fisheries related trade missions to China, Scandinavia and Germany, among other countries.

MR. GABE GREGORY, ST. JOHN'S, NEWFOUNDLAND

Mr. Gregory holds a BCom from Memorial University of Newfoundland and a Professional Business degree. Mr. Gregory joined the former Fishery Products Limited in 1980 and has had a progressive senior management career at Fishery Products International. He is currently Vice-President of Atlantic Operations where he is responsible for all of the company's harvesting and processing operations in the Atlantic Region. Mr. Gregory is an active member of several Industry Associations.

MR. FRANK HENNESSEY, SOURIS, P.E.I.

A full-time fisherman in the Gulf of St. Lawrence, Mr. Hennessey has worked in the fishery since 1967. In these 26 years, he has fished both inshore and offshore, and is now the owner and master of a 55' mid-shore trawler. Mr. Hennessey has a long history of involvement in fishermen's organizations and advisory committees to governments, and has participated in workshops and international technical visits. Since 1988, Mr. Hennessey has been President of the P.E.I. Groundfish Association.

DR. DANIEL LANE, OTTAWA, ONTARIO

Dr. Lane is Professor and Vice Dean and Associate Dean (Research) at the Faculty of Administration of the University of Ottawa. A native of Saint John, New Brunswick, he holds a B.Sc. in Mathematics from St. Francis Xavier University in Antigonish, Nova Scotia, an M.A.Sc. in Management Sciences from the University of Waterloo, and Ph.D. in Management Sciences from The University of British Columbia. His research interests are in systems modelling and decision making processes as applied to the management of fisheries. He has been involved as peer reviewer, and working group member for DFO, and has ongoing research initiatives on the evaluation and performance of fisheries with the International Council for the Exploration of the Sea (ICES), and the Fisheries Committee of the Organization for Economic Cooperation and Development (OECD).

DR. EDWARD J. MCALDUFF, ANTIGONISH, NOVA SCOTIA

Dr. Edward J. McAlduff is Dean of Science and professor of chemistry at St. Francis Xavier University (Nova Scotia). He holds a B.Sc. in chemistry as well as a PHD in physical chemistry. He has been a member of several external committees and boards such as Technical University of Nova Scotia Senate; Natural Science and Engineering Research Council Scholarship Liaison office; Atlantic Provinces Council of Science; Chair Atlantic Deans of Arts and Science and member Academic Advisory Universities-Maritime Provinces Higher Education Committee. He has extensive teaching experience at the university level in the field of Chemistry.

MR. JOHN POPE, UNITED KINGDOM

Mr. Pope is a part-time professor at the University of Tromso in Northern Norway. He is considered by the science community as a pioneer in modern fisheries assessments. Mr. Pope is newly retired from a successful career at the Lowestoft Laboratory in England and remains active as a consultant in fisheries matters. He was a member of the Independent Review of the State of the Northern Cod Stock and the Harris Panel as well as a member of the Task Group of Newfoundland Inshore Fisheries.

DR. GEORGE ROSE, ST. JOHN'S, NEWFOUNDLAND

Dr. George Rose is Professor and Senior Chair of Fisheries Conservation of the Fisheries and Marine Institute at Memorial University of Newfoundland. He holds a BSc in fisheries management, and an MSc and PhD in biology.Dr. Rose has been an outspoken scientist for a prudent approach to the management of Atlantic fisheries. He has worked for several fisheries organizations and is a consultant to the US and New Zealand governments on fisheries assessments and research. Dr. Rose is well known in Newfoundland and his work on cod and acoustic survey techniques is highly respected in the scientific community.

MR. LOUIS SCHOFIELD, BAIE STE. ANNE, NEW BRUNSWICK

Louis Schofield is a former President of Local 2 of the Maritime Fishermen's Union (MFU). Mr. Schofield is a long time bona fide fisherman who is widely respected within the MFU. He is very compassionate about the fishing industry and its place in our social and economic spectrum. He has participated in international fishermen exchanges.

MR. TREVOR TAYLOR, ST. ANTHONY, NEWFOUNDLAND

Mr.Taylor is the captain of a 55-foot shrimper/crabber.As a fisherman he has fished a variety of species including cod and turbot, using various gear types such as cod traps, gillnets and otter trawls. From 1991-94 Mr.Taylor was elected to the Inshore Fishermen's Council. From 1992 to 1998 he served on the board of the Fishermen, Food and Allied Workers' Union (FFAW) and was appointed coordinator of the Newfoundland Fishermen's Resource Centre in Corner Brook. Mr.Taylor has completed fishery-related training at both Memorial University and its Marine Institute.

MAUREEN YEADON, HALIFAX, NOVA SCOTIA

Maureen Yeadon was most recently Vice President, Government Relations, of National Sea Products Limited. From 1982 to 1993, Mrs. Yeadon held various positions with NSP, including management of company's fleet operations and responsibility for the company's communications and public relations.

EX OFFICIO MEMBERS

From the Department of Fisheries and Oceans:

DR. W. DOUBLEDAY, DIRECTOR GENERAL, BIOLOGICAL SCIENCES

Dr. Doubleday attended Queen's University in Kingston where he received a B.Sc (Hon) in Mathematics and Chemistry, and from the University of Sheffield, he obtained a M.Sc. a Ph.D. in 1973 in Probability and Statistics. He then joined the Public Service of Canada as a research scientist at St. Andrews. Serving as Director of the Fisheries Research Branch, and Director, Policy and Program Coordination for Science, Dr. Doubleday was promoted to Director General, Policy and Strategy Directorate for Science, and acted on two occasions as Assistant Deputy Minister, Science. Dr. Doubleday is a member of the FRCC, former Chairman of the Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC), and is currently Director General, Fisheries and Oceans Science Directorate.

MR. BARRY RASHOTTE, DIRECTOR, RESOURCE ALLOCATION MANAGEMENT, ATLANTIC

Mr. Rashotte obtained a BSc (Honours) in Biology from Queen's University in Kingston in 1974. He was hired by the Department of Fisheries and Oceans as a fisheries officer in Yarmouth, Nova Scotia, moving after three years as a field officer to Regional Headquarters in Halifax to deal with licensing policy and regulations. He later moved to Ottawa, progressing to his current position.

MR. GUY BEAUPRÉ, DIRECTOR GENERAL, POLICY COORDINATION AND LIAISON

Born in Montreal, Mr. Beaupré obtained an M.A. in Economics from the Université du Québec à Montréal. After several years of economic and fiscal analysis and forecasting at the Department of Finance, Mr.Beaupré moved to the Federal-Provincial Relations Office in Ottawa, later moving to the Privy Council Office where he dealt with policy development and intergovernmental affairs. Mr. Beaupré joined the Department of Fisheries and Oceans in January 1998 where he is responsible for parliamentary, legislative and regulatory affairs, and intergovernmental affairs.

FROM THE PROVINCIAL GOVERNMENTS AND TERRITORIES:

MR. STEPHEN ATKINSON, NORTHWEST TERRITORIES

Mr.Atkinson is the fisheries advisor in the Department of Resources, Wildlife and Economic Development of the Government of the Northwest Territories.

MR. DAVE LEWIS, PROVINCE OF NEWFOUNDLAND AND LABRADOR

Born in Gander, Newfoundland, David Lewis holds a B.Sc.(Honours), a B.Ed and an MBA from Memorial University of Newfoundland. Mr. Lewis worked for DFO Research Branch as a technician prior to the Government of Newfoundland and Labrador at the Department of Rural Development as a business analyst, as Executive Assistant at the Fisheries Association of Nfld and Lab (FANL). He returned to the province at the Department of Fisheries as Director of Planning, and the Department of Social Services as Director of Income Support. Mr. Lewis is currently Executive Director, Policy Branch, Newfoundland Department of Fisheries and Aquaculture.

MR. PAUL CORMIER, PROVINCE OF NEW BRUNSWICK

Mr. Cormier is the provincial representative for the province of new Brunswick

MR. DAVID GILLIS, PROVINCE OF PRINCE EDWARD ISLAND

A native Islander, Mr. Gillis is a marine fisheries biologist for the Department of Agriculture, Fisheries and Forestry. In addition to his work with the FRCC he represents the province in fisheries management issues for a number of species, including lobster, scallops and groundfish and acts as a liaison with DFO Science on resource issues and supervises marine resource sampling and harvest efforts undertaken by the Province. Prior to 1989, Mr. Gillis worked on a range of fisheries development and management issues in the eastern Arctic for Makivik Corporation of Quebec and has worked for several offshore commercial fishing companies operated by the Inuit of that region.

MR. DARIO LEMELIN, PROVINCE OF QUEBEC

Mr. Lemelin works in Stratégies et politiques au Ministère de l'agriculture, des pêcheries et de l'alimentation in Quebec City. He has a degree in Biology from the Université Laval. He has worked for the past thirteen years in Fish Inspection as an inspector and as a coordinator.

MR. CLARRIE MACKINNON, PROVINCE OF NOVA SCOTIA

Mr. MacKinnon is Marine Advisor for Groundfish and Seaplants with the Nova Scotia Department of Fisheries. Prior to this, he worked for several years in the media and in public relations. At Fisheries he has held the positions of Manager of Field Services and Aquaculture Administrator. Mr. MacKinnon is a graduate of Mount Saint Vincent University in political science and has a Master of Marine Management from Dalhousie University. He has been a community activist for many years and has spent over a decade in municipal politics. The future of small and independent fishers and coastal communities are concerns he advances at every opportunity.

SECRETARIAT

Chris J. Allen
Tracey Sheehan
Denis Rivard
Marny Brown
Andrée-Anne Guibord
Lisa Tenace
Debra Côté

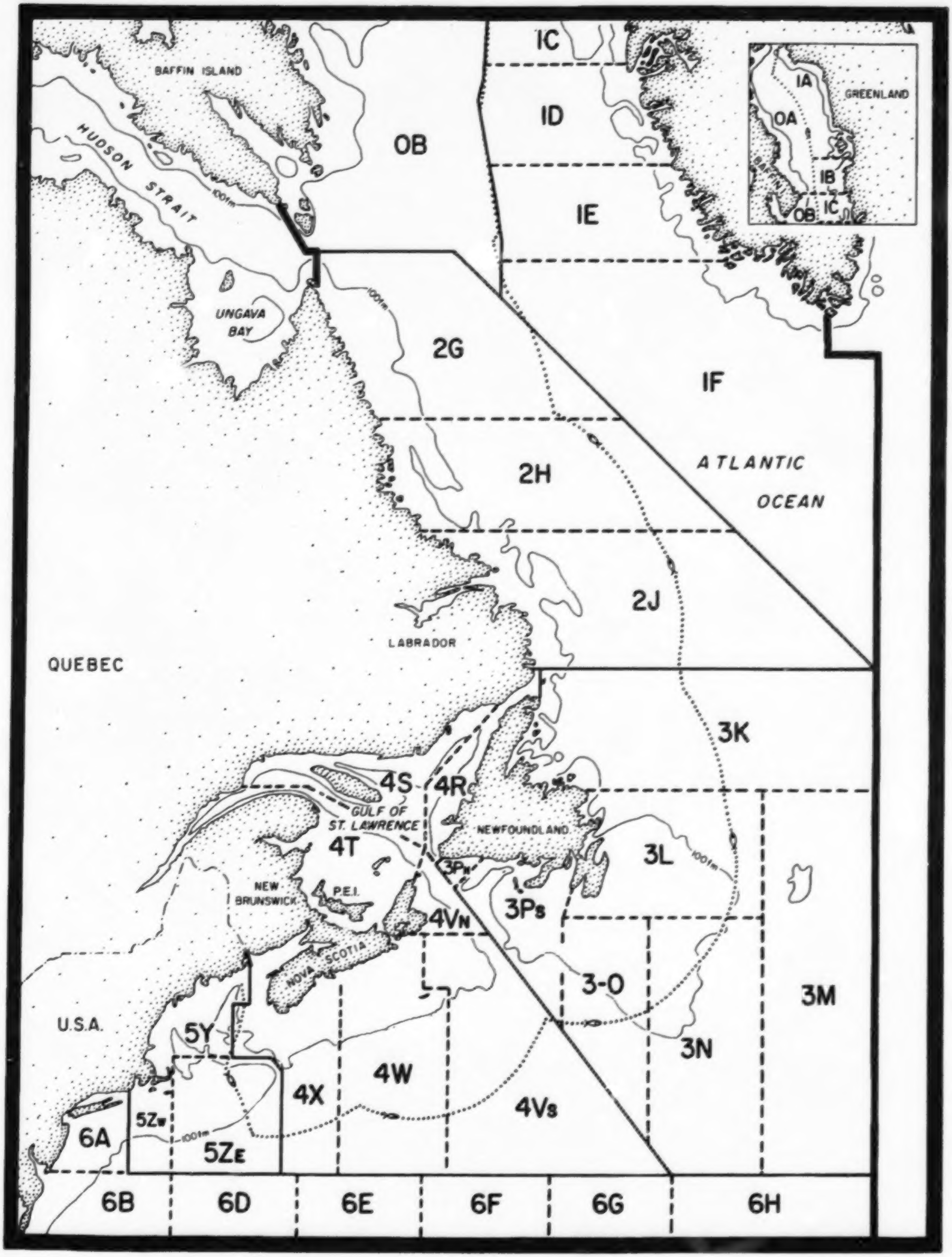
APPENDIX 4:
FRCC PUBLICATIONS

FRCC PUBLICATIONS

FRCC.99.R.3	1999 Conservation Requirements for Cod Stocks in Division 2J3KL(May/99)
FRCC.99.R.2	1999 Conservation Requirements for Georges Bank (May/99)
FRCC.99.R.1	1999 Conservation Requirements for the Gulf of St. Lawrence Groundfish Stocks and Cod Stocks in Divisions 2GH and 3Ps and Science Priorities Letter to Minister (April/99)
FRCC.98.R.6	1999 Conservation Requirements for Scotian Shelf and Bay of Fundy Groundfish Stocks, Redfish Stocks, Units 1-3 and 3-0, and Groundfish Stocks in Division 3Ps. (November 1998)
FRCC.98.R.5	1999 Conservation Requirements for Groundfish Stocks Other Than Cod in Sub Area 0 and Area 2+3 (except 3ps). (October 1998)
FRCC.98.R.4	Georges Bank - 1998, 1998 Conservation Requirements for Georges Bank Groundfish Stocks (May 1998)
FRCC.98.R.3	"Towards an Ecosystem Approach to Fisheries Management", Report of the Environment and Ecology W orkshop held at the University of Moncton, Dec. 15-16, 1997 (May/98)
FRCC.98.R.2	Conservation Must Be Compulsory, Not Optional - Annual Report of the FRCC and Conservation Requirements for Atlantic Groundfish Stocks for 1998 (May/98)
FRCC.98.R.1	1998 Conservation Requirements for the Gulf of St. Lawrence Groundfish Stocks and Cod Stocks in 2GH, 2J3KL, 3Ps, 4VsW and W itch Flounder in Division 3Ps and Science Priorities Letter to Minister (Mar/98)
FRCC.97.R.7	1998 Conservation Requirements for Redfish Units 1, 2, 3 and Division 3-0 (Nov/97)
FRCC.97.R.6	1998 Conservation Requirements for the Scotian Shelf and Bay of Fundy Groundfish Stocks (Nov/97)
FRCC.97.R.5	1998 Conservation Requirements for Grand Banks, Labrador Shelf and Davis Strait Groundfish Stocks (Oct/97)
FRCC.97.R.3	A Groundfish Conservation Framework for Atlantic Canada (July/97)
FRCC.97.R.2	Georges Bank - 1997 Conservation Requirements for Georges Bank Groundfish Stocks (May/97)
FRCC.97.R.1	A Report on Gear Technology in Eastern Canada Prepared by the Gear Technologies Subcommittee (March/97)
FRCC.96.TD.3	Quota Controls and Effort Controls, Conservation Considerations - A Discussion Paper Prepared by the Management and Regulations Subcommittee (Dec/96) Letter to Stakeholders
FRCC.96.L.2	Science Priorities Letter to Minister (Dec/96)
FRCC.96.R.2	Building the Bridge - 1997 Conservation Requirements for Atlantic Groundfish (Oct/96)
FRCC96.R.1	Learning from History, Prepared by the Historical Perspective Subcommittee (July/96)

FRCC96.TD.2	From Moratorium to Sustainability: Criteria for Re-Opening and Sustainable Harvesting, with Reference to Cod Stocks in Areas 3Ps, 4TVn and 3Pn4RS Prepared by the Stock Assessment Subcommittee (June/96)
FRCC.96.L.1	Letter to the Minister: Georges Bank Haddock, Cod and Yellowtail Flounder Subarea 5Zjm (May 14/96)
FRCC96.TD.1	Consultation Paper on Gear Technology, Prepared by the Gear Technologies Subcommittee (Jan/96)
FRCC.95.R.2	Conservation Come Aboard - 1996 Conservation Requirements for Atlantic Groundfish (Nov/95)
FRCC.95.R.1	A Conservation Framework for Atlantic Lobster (Nov/95)
FRCC.95.L.1	Letter to the Minister; Georges Bank Haddock and Cod, Subarea 5Zjm (May 19/95)
FRCC.94.TD.4	Conservation Aspects of Groundfish Gear Technologies in Eastern Canada, Prepared by the Gear Technologies Subcommittee (Dec/94)
FRCC.94.R.4	Conservation Stay the Course - 1995 Conservation Requirements for Atlantic Groundfish (Nov/94)
FRCC.94.TD.3	Some Issues Related to Seal-Fisheries Interactions in Eastern Canada, Prepared by the Environmental and Ecology Subcommittee (Sept/94)
FRCC.94.TD.2	Report to the Minister on Other Conservation Measures (Sept/94)
FRCC.94.TD.1	Considerations on How to Re-Open a Closed Fishery, Prepared by the Stock Assessment Subcommittee (1994, 1995)
FRCC.94.R.3	Report to the Minister of Fisheries and Oceans on Greenland Halibut (Turbot) in NAFO Subareas 0, 1, 2 and 3 (June 20/94)
FRCC.94.L.1	Letter to Minister regarding Science Priorities (Jan/94)
FRCC.93.R.2	Partners in Re-building Fish Stocks for our Future - 1994 Conservation Requirements for Atlantic Groundfish (Nov. 29,/93)
FRCC.93.R.1	W e Must Stop Chasing Quotas Down to the Last Fish - 1993 Conservation Requirements for Atlantic Groundfish (Aug/93)
FRCC.93.L.1	Letter to Minister regarding Silver Hake (August 23/93)
	Letters to Minister regarding NAFO (1993, 1994, 1996)

200 MILE FISHING ZONE AND NAFO FISHING BOUNDARIES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